# The Journal of Obstetrics and Gynaecology of the British Empire

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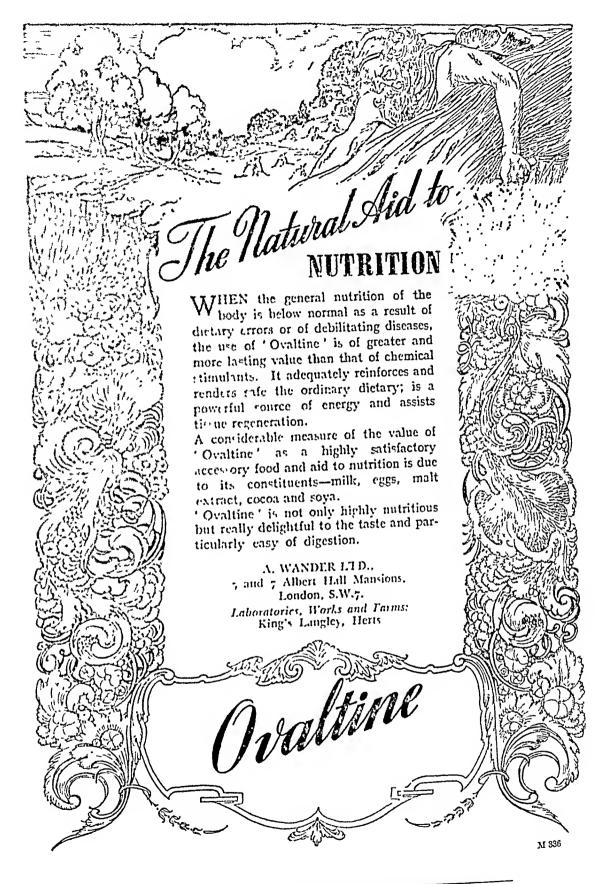
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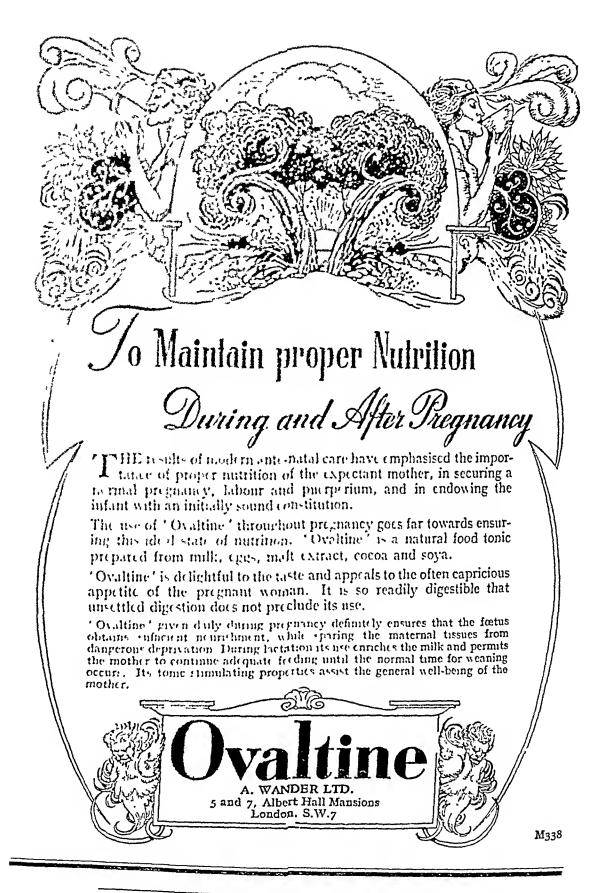
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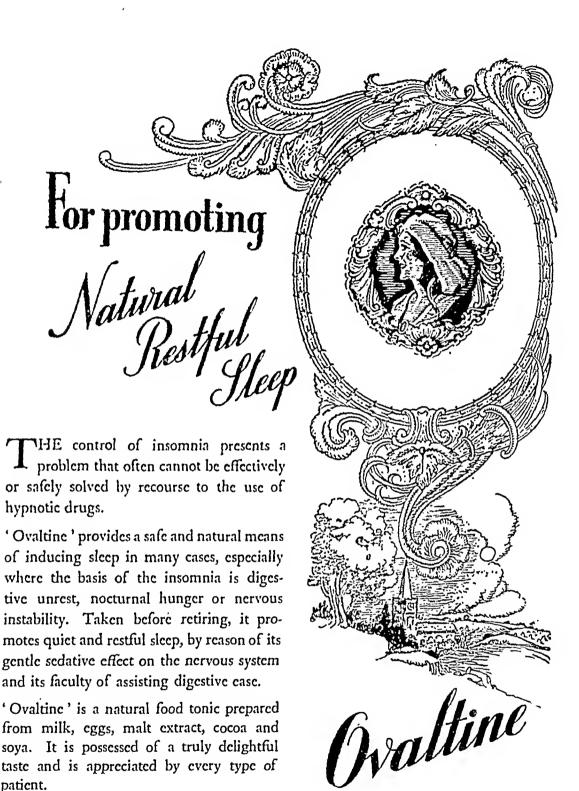
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The Composition of the Blood of Women during Pregnancy and after Delivery

H. Hoch, Ph.D. (Vienna), Lecturer in Chemical Pathology, University of London,

J. R. MARRACK, D.S.O., M.C., M.A., M.D., Professor of Chemical Pathology, University of London, with technical assistance of R. H. Ruse and R. Hoch.

Together with a Survey of Diets made by the War-time Social Survey.

At the end of 1943 we began an investigation of the changes of various constituents in the blood during pregnancy and the puerperium and the relation of these changes to diet and the health of mother and baby. On the suggestion of Dr. Magee of the Ministry of Health we proposed to follow a limited number of subjects from the Borough of Stepney from the first attendance at the antenatal clinic of the London Hospital to their latest attendance at the infant welfare clinics of the borough. However, Dr. J. W. Crawford, the Deputy Medical Officer of Health of the Borough, who was largely instrumental in promoting the investigation and who would have condition at the infant welfare clinics, was .1.8 previous pregnancies.

called to the Forces. The work was disorganized in summer, 1944, by flying bombs and later by rockets; most of the subjects whom we had selected for study left London and were lost sight of.

The laboratory work was continued, although it was not possible to follow more than a small number of the subjects through pregnancy and puerperium. One hundred and seventy subjects (average age 27.5) were chosen at random from all women attending; of the 97 antenatal cases, 57 were primiparae (average age 26) and 40 (average age 29.5) have had in the mean 2.1 previous pregnancies. Of the remaining 73 cases, studied only after delivery, assisted in keeping check of the subjects and AI were primiparae (average age 24.5) and have supervised the study of their clinical -33 (average age 30.5) have had in the mean The results of the estimates of haemoglobin in blood and of iron, proteins, vitamin A, carotenoids, ascorbic acid and alkaline phosphatase in serum illustrate the levels of these constituents of pregnant women during the later years of the war, the changes during pregnancy and after delivery, and the relation between these changes.

The diets of 10 of our subjects were investigated by the War Time Survey, and the blood was examined at the same time; the diets of a larger series of subjects living in a neighbouring part of London were studied at the same time. These surveys give an indication of the type of food that our subjects were eating.

#### METHODS.

Photoelectric photometers of the Evelyn test tube (Hoch, 1944) and flat cell type were used in the estimation of hacmoglobin, vitamin A, carotenoids, serum iron, and ascorbic acid. One of the galvanometers used showed different sensitivities different deflexions and it was therefore calibrated at 15 points by means of a potentiometer. The non-linearity of the galvanometer was allowed for in the estimations by correcting the blank readings to a value which would have been obtained had the readings for the blank and unknown been in the same proportion as the currents passing the galvanometer. A graph was used giving the deviations from proportionality of current and deflexion of 2 readings (one representing a blank reading in the actual estimation) in dependence of the difference of the 2 readings. The error due to galvanometer drag was eliminated by taking readings after a standard time (10 secs.) in the calibration and in all the actual estimations. Although this error was but a fraction of a mm. it required attention, in particular when high extinctions had to be measured. The test-tube instrument

had the advantage over the flat-cell type of allowing samples to be centrifuged in the same containers in which they were measured. Centrifugation was advisable in the estimations of haemaglobin and carotenoids. For small extinctions such as those obtained in the estimation of serum iron the necessary accuracy in the readings was obtained by a double-cell electrically compensated instrument in which a galvanometer of high sensitivity was used as a nullpoint indicator.

The haemoglobin was estimated by the Haldane-Gowers method. These estimations were made by observer 22 in Table XXII of the report of the Haemoglobin Survey Committee (Medical Research Council, 1945) using one Hb-CO standard colour tube calibrated by the National Physical Laboratory. The correction factors were 0.983 in June 1943 and 0.980 in January 1946. On a certain number of cases, as shown in Table II, the solutions which were found to match the standard (or some others which had been slightly overdiluted by a known amount) were regassed, centrifuged in a stoppered tube and measured with the photometer with an Ilford filter No. 604 (green) or No. 605 (yellow-green). [The calibration of the photometer to read in agreement with the N.P.L. standard is to be described in a separate paper (Jope and Hoch, in preparation). The coefficient of variation of the reproducibility of the photoelectric method, calculated from 90 duplicate and triplicate measurements on 42 specimens of diluted and gassed whole blood in an earlier series, was V = 0.14 per cent. The greatest deviation from the mean was 0.46 per cent.] Possible errors in pipetting and reading the meniscus were not eliminated in this way. The values obtained by this method appear in Tables\_I and II, as photoelectric estimates.

We regard the estimates made by the

\* TABLE I.

Comparison of Visual and Photoelectric Determinations of Haemoglobin (113 Subjects).

		enatal	
Duration of pregnancy weeks	Number of samples	Per cer Visual	nt Haldane Photoelectric
14	II	90.56	91.76 (a)
15, 16	14	93.81	90.24
17, 18	15.	90.42	88.29 (b)
23-26	12	82.20	84.72
19-22	17	89.53	90.95
27-32	II	82.56	84.75
33-39	II	84.48	85.10
All weeks	91	88.04	88.23
	Doort	natal	

	Posti	natal	
Days after	Number of samples	Per	cent Haldane
delivery		Visual	Photoelectric
3-14	35	87.43	88.21 (c)
15-63	8	92.34	94.66
All days	43	88.35	88.41

<sup>(</sup>a), (b), (c). Five cases of anaemia included (see footnote to Table II).

photoelectric method as those most nearly correct and have used these as basis for discussion. In the report of the Haemoglobin Survey Committee (Medical Research Council, 1945, p. 18) it is stated that "the performance of the 4 best observers," in respect of variability, "was better than that obtained with a colorimeter (Evelyn) tested at the same time." This is not surprising and is somewhat irrelevant. The important questions are whether, with a photoelectric instrument, the readings made by the 4 best observers would differ by 7.9 per cent as did those of the 4 best in Table XXII of that report; and whether the readings made by experienced observers, using this photometer, would differ by 18 per cent, as did those of Nos. 6 and 35.

The visual and the photoelectric tech-

nique gave good agreement in the grand means (Table I) but means of groups of 8 to 17 individuals differed by up to 3.6 per cent on the Haldane scale. The distribution of the discrepancies between the visual and the photoelectric values for 138 samples (including 3 samples from controls not referred to in Table I) is shown at the foot of this page.

The average deviation was 4.75 per cent. The worst visual estimates occurred when the colours were matched in bad daylight.

The total proteins were estimated by a micro-Kjeldahl technique (Hoch and Marrack, 1945) with SeO<sub>2</sub> at a catalyst. The digestion time was 3 to 3½ hours. In a few cases in which an alternative procedure had been used, such as one omitting the SeO<sub>2</sub>, the results have been corrected so as to become comparable with the others. The average values given in this paper may still be up to 1 per cent low with respect to the standard technique of Chibnall, Rees and Williams (1943), using a digestion time of 17 hours.

The albumin was determined by the method of Howe (1921) on filtrates from a mixture of 0.5 ml. serum and 15 ml. 22.2 per cent Na<sub>2</sub>SO<sub>4</sub> at 37°C. in aliquots corresponding to 0.165 ml. serum.

The non-protein nitrogen (N.P.N.) was determined on 2 ml. aliquots of filtrates from a mixture of 0.5 ml. serum and 4.5 ml. 5 per cent trichloroacetic acid.

The estimation of carotenoids, expressed as  $\beta$ -carotene,  $\beta$ -carotene and vitamin A, is described elsewhere (Hoch and Hoch, 1946; Hoch, 1944). The proportion of  $\beta$ -carotene in total carotenoids was estimated after chromatography of the carotenoids on alumina.

Deviation of visual from photoelectric value in per cent of photoelectric value

cent of photoelectric value <-15 -15 to -10 - 10 to -5 -5 to +5 +5 to +10 +10 to +15>+15

frequency 1 4 26 75 25 5 2

TABLE II.

Concentrations of Constituents of blood and serum, during and after Pregnancy. The numbers of samples are given in brackets.

				The numbers	1 vo e130111							
								Scarotene	3-carotene			
Antenatal Duration of	Haemoglobin per cent		Serum protein		Non-protein- nitrogen mg./100	Vitamin A I.U., 100	Total caratenoids ag. 100	after	1	Serum Fe	Serum phosphatase units/100 ml.	mg./100 ml.
pregnancy	Visual	Haldane Photoelectric	Total Albur	min	ml.	mi.	mi.	4 55 57	1 3	(9) 123	(3) 5-7	(11) 0.66
To 14	(II)93.I(a)	(10) 94.9(a) (12)6.99 (11) 4.31	(12)6.99		(11)25.1	(2)		9707 (01)	19.3-13.5	8.4-150 (3) 1.5	. (11) 7-3	(20) 0.5 (01) -1.0
15, 16	(20)92.8	5.06 (11)	(18)6.96 (10) 1.33		1.87,23.1	(17)103.0		10000	16.1-12.0	78-193 (10)106	9'9 (2)	(17) 0.52
17, 18	(16)92.8(b)	(14) 91.1(b) (17)6.89		01:1(01)	(10) 23-3	9.96 (11)		5.53 (81)	16.5-55.5	30-140 (13)112	(6) 7.0	(22) 0.51 0.1 -1.5
19–22	(22)89.3	1.00 (81)	(23)6.87	(17) 1.13	(23) 22. {	(15)102.1	41-151	8 16 (11)	22.1-17.0	76-150 (8) 96	(8) 8.1	(15) 0.50
23-26	(15)81.6	(12) 84.7	(15)6.72	(12)3.95	6.02 (31)	£-95 (01)	54-134	2(1.1)	20.6-38.0	57-1 to (5) 106	(14) 9.3	(18) 0.43
27-32	, (20)85.1	(11) 8.4.8	(20)6.63	60.1 (01)	1.52 (02)	(15) 96.1			0.65-1.11	60-126	(10)	(12) 0.50
33-39	6.58(51)	(11) 85.1	(14)6.67	(9)3.81	(13) 23.1	(15) 102.0	061-69	1:67(11)	17.6-11.4	72, 93		0.2
Postnatal	٠ ١								3		(1)12.5	(1) 0.8
delivery	(1)79.2	(I) 88.8	(2)6.33	(1)3.58	(2)31.0	(8) 125	(8) 113.0 67-158	(8)35.4	(S)33.5 18.0-51.4 (8)32.2		(2)10.7	(2) 0.1
.3,4	(3)86.7	(2) 90.6	(3)6.69	(1) 1.08	(3) 29.7	(8)		0-15(6)	18.9-44.6		(16) 17.3	01.0 0.40
5-7	(14)97.0(c)		(4) IOI.I(C) (17) 7.II	(5)3.8.	(17)35-3			7 30 (30)	17.4-42.0	1	(34)13-4	
8-14	(33)90.9	(26) 89.9	(34)7.03	(11)4.07	(34)34.8	<u>e</u>	ာ	(33) =3.7	12.5-39-4 (9) 29.9	İ	1.8 (9)	(8) 0.16
14-63	(9) gr.3	(8) 94.7	(9)7.18	(7)4.30	o (9)33.o				16.6–51.5	1		(19) 0.65 0.1-1.3
Controls	S	(23) 99.7	, (33)7.43	1	İ	(61)	5.4-122				thing you true	d. The patients
	y O of fo enters	(a) One malue of so o visual and 60.1 photoelectric	photoelectric		Three val	(c) Three values omitted:	visual 59.4	photoelectric 55.3	(d) Two had l	o values of 3: liver for the 1	Two values of 333 and 300 characters had liver for the meal before the blood was taken.	lood was taken.
(a) One var omitted. (b) One va	ed. value of 48.2	omitted. One value of 48.2 visual and 49.5 photoelectric	photoelectric	n				58.2 58.7			,	
omitted	ted.									•		

The serum iron was determined by the method of Vahlquist (1941). The colour given by the o-phenanthrolin was measured photoelectrically with an Ilford filter No. 603 (blue green). Large errors may arise from contamination by iron from dust, soot, glassware, and the agreement of duplicates is occasionally not as good as desirable. The estimations were carried out on 0.5 ml. samples of serum. The frequencies of the differences between two duplicate analyses were:

Difference between duplicates in  $\mu g. / 100 \text{ ml.}$  0-4 5-8 9-12 14-15 18-19 frequency 30 10 5 2 2

A difference of 8µg./100 ml. corresponded to one of 0.0019 in the extinctions actually measured.

The alkaline phosphatase of serum was estimated by the methods of King and Armstrong (1934) and King, Haslewood and Delory (1937).

The ascorbic acid was determined by the method of Roe and Kuether (1943) on 1.35 ml. serum. The Ilford filter No. 605 (yellow-green) was used.

The controls were members of the nursing staff of the London Hospital (haemoglobin, vitamin A, carotenoids, ascorbic acid) and nurses and laboratory staff, men and women (serum proteins); no difference has been found between the concentrations of proteins in the serum of men and of non-pregnant women.

#### RESULTS.

Haemoglobin.

Antenatal. The mean concentration of haemoglobin fell until the 24th week and then remained nearly constant (Table II). If we plot haemoglobin concentration against period of pregnancy, we get a curve very similar to that obtained by Boycott (1936) and others, and by the 1943 Haemoglobin Survey (Medical Research Council,

1945). As the number of our cases was relatively small the slight rise in the last weeks of pregnancy may be a matter of chance. But Dieckmann and Wegner (1934a), Boycott (1936), Cohen and Thomson (1936), Bethell, Gardiner and MacKinnon (1939), the 1943 Haemoglobin Survey (Medical Research Council 1945) and Roscoe and Donaldson (1946) found a similar rise.

The actual height of our curve cannot be compared with that of Boycott's curve because we do not know whether Boycott's colour tube agreed with the N.P.L. standard. Our curve is some 2.5 to 5 per cent higher than that of the 1943 survey. It is probable that this apparent difference is artificial. For the average of the estimates of haemoglobin concentration made by the visual method by the observers whó carried out the 1943 Survey, on a series of test bloods, was about 4 per cent. below those obtained in the National Physical Laboratory (Medical Research Council, 1945, p. 67); whereas the readings obtained by the photoelectric method in this survey (see methods) were calibrated to agree with those of the National Physical Laboratory. The survey of Young, King, Wood and Wootton (1946) in West London was made during much the same period as ours; they estimated haemoglobin by the alkaline haematin method of Glegg and King (1942) and expressed it in g. of haemoglobin per 100 ml. If we assume that 100 per cent Haldane is equivalent to 14.8 g. of haemoglobin per 100 ml. (King, Gilchrist and Matheson, 1944) the mean concentrations found by Young et al., were 83 per cent Haldane, in the first 24 weeks and 78 per cent in the last 8 weeks of pregnancy. These means are definitely lower than those of the 1943 Survey and than our means. This difference may be due to a difference in the proportion of the women who were treated with iron. No mention is made of

treatment by Young et al., nor in the Report of the 1943 Survey. Iron was prescribed for all those women attending the antenatal clinic at the London Hospital who were suspected of having anaemia and to a large proportion of the others; unfortunately the records of the numbers treated are incomplete.

The cases shown in Table III were bled at their first attendance at the clinic, when iron had not been prescribed.

Table III.

Concentration of Harmoglobin in the Blood of 52
Subjects to whom iron had not been prescribed.

Period of pregnancy weeks	Number	Mean concentration of haemoglobin
10 13	()	95.0
15, 16	4	99.8
17, 18	- 8	84.4
19-22	10	88.7
23-26	10	85.1
27-32	ti	88.45
33-39	3	82.2

The 3 mean concentrations, found toward the end of pregnancy (1943 survey, 82.4 in last trimester; Young ct al., 78 in last 8 weeks; our survey, 85 in last 8 weeks), are higher than that found by Hamilton and Wright (1942) in 1941-42, in a group of women who had all been treated with iron. Roscoe and Donaldson (1946) in Edinburgh found a lower mean concentration (78.2) among women in the last trimester in 1944. During the last 13 weeks of pregnancy 22 estimations were made photoelectrically and 13 others visually only; among these 35, one reading only was under 70 per cent; out of all the 91 readings 4 only were under 70 per cent (Table IV).

Postnatal. In the limited number of subjects that were examined in the second half of the first week after delivery the concentration was appreciably higher than it was before delivery or in the second and following week. The concentration in the second week was above that before delivery

and there was a further rise during subsequent weeks. In 13 cases the haemoglobin was estimated before and I or more weeks after delivery; in 5 of these the concentration after delivery was more than 3 per cent higher than before. In 4 cases it remained within ± 3 per cent of the level before delivery; in 2 of these the estimation before delivery was made before the 20th week of pregnancy. In 4 it was over 3 per cent lower; in 2 of these the estimation before delivery was made before the 20th week; one of these two had toxaemia of pregnancy and a breast abscess and one of the other two had a severe postpartum haemorrhage. This rise after delivery was found by Cohen and Thomson (1936), McGeorge (1936), Widdowson Bethell, Gardiner, and MacKinnon (1939), Mull and Bill (1945) and Young et al. (1946). Fullerton (1936) however, dealing with the poorest classes in Aberdeen, found that the average level, 2 to 5 months after delivery, still differed little from that at term; and the cases of Dieckmann and Wegner (1934a) did not regain the level of early pregnancy by the 8th to 17th week after delivery.

#### Serum Iron.

The concentration of iron in the serum (Table II) varied widely. No relation was found between the concentration of iron in serum and of haemoglobin in whole blood or between concentration of iron and duration of pregnancy, either among those for whom iron had not been prescribed or in the whole series. Vahlquist (1941) also found no relation between serum iron and haemoglobin.

#### Serum Proteins.

Antenatal. The mean concentration of serum protein (Table II) fell and reached a minimum at about the same time as did the mean concentration of haemoglobin.

Table IV.

Number of Cases with low Concentration of Haemoglobin, Serum Protein and Vitamin A, and with High Phosphatase.

	Haen	noglobin per	cent Halo	lane	Duntain a	Serum	77:4	A	Phosphatase
Weeks of pregnancy		isual under 75	Photoe under 70		~	albumin g. per 100 ml. under 3.5	I.U. per	roo ml.	units per 100 ml. over 10
to 14	I	ľ	I	I	0	0	0	0	0
15, 16	o	I	o	I	o	I	o	o	2
17, 18	I	I	I	I	o	О	o	I	o
19-22	o	О	O	o	o	o	o	I	I
23-26	I	I	I	I	I	О	o	1	I
27-32	I	3	r	I	o	I	О	4	4
33~39	o	Ι	o	o	0	О	I	1	9
Total	4	8	4	5	1	• 2	I	8	17

Again the concentration rose slightly in the last few weeks; a similar rise was found by Bibb (1941) and Mull and Bill (1945) and a greater rise by Plass and Matthew (1926).

The difference (0.36) between the mean value found at the earliest stage of pregnancy and that in the last 8 weeks was more than that found by Bibb (1941) and less than that (0.55) of Plass and Matthew (1926) and than that (0.6) of Mull and Bill (1945), who examined the largest number of subjects. The difference between the average concentrations among non-pregnant subjects and the lowest level in pregnancy (0.8) was about equal to that (0.71) of Plass and Matthew (1926) and that (0.79) of Oberst and Plass (1932) but less than these (0.88 and 1.16) of Oberst and Plass (1936). Like Plass and Matthew (1926) we find that the fall in serum protein was entirely due to reduction of serum albumin; the serum globulin remained constant.

The actual levels of serum protein found by various investigators cannot be compared owing to differences of methods used in estimation. However, Plass and Matthew (1926) found a level among non-pregnant women very near to ours, if allowance is made for the effect of oxalate; and their levels among pregnant women are, also, very close to ours. Dieckmann and Wegner (1934b) also found mean concentrations very similar to ours and few cases with total proteins under 6 g. per 100. ml. of serum (cf. Table IV).

In our series the serum protein fell by about 5 per cent between the earliest period (under 14 weeks) and the 22nd to 32nd week; and the difference between levels among non-pregnant women and women in the 22nd to 32nd week in pregnancy was about 10 per cent. The corresponding reductions of haemoglobin were 10.8 and 15 per cent. It would, perhaps, be more correct to compare the reduction of albumin with that of haemoglobin, as the serum globulin remained constant. The corresponding reductions of albumin are about 10 and 16 per cent, so that the reductions, per cent of haemoglobin and albumin, are approximately equal; the curve of fall of serum albumin ran roughly parallel to that of haemoglobin. However, if the reduction of the concentration of haemoglobin in blood and albumin in plasma were simply due to dilution of the plasma it would be expected that the reduction per cent of albumin would be twice that of haemoglobin.

As might be expected from the independent variations of haemoglobin and serum protein in non-pregnant adults, there was little evidence of correlation between treatment by Young ct al., nor in the Report of the 1943 Survey. Iron was prescribed for all those women attending the antenatal clinic at the London Hospital who were suspected of having anaemia and to a large proportion of the others; unfortunately the records of the numbers treated are incomplete.

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27 J.	f)	84.55
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Postnatal. In the limited number of subjects that were examined in the second half of the first week after delivery the concentration was appreciably higher than it was before delivery or in the second and following week. The concentration in the second week was above that before delivery

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Weeks of pregnancy		Visual o under 75	Photoe under 70		per 100 ml.	per 100 ml.	I.U. per	100 ml.	100 ml. over 10
to 14	ı	I	r	ı	0	0	0	0	0
15, 16	0	ı	o	r	О	r	О	o	2
17, 18	ı	r	r	ı	o	0	o	r	o
19-22	Q	О	o	o	o	0	o	r	I
23-26	I	r	r	r	I	О	О	r	r
27-32	r	3	I	1	О	ı	o	4	4
33-39	0	I	o	O	o	О	ı	1	9
Total	4	8	4	5	ı	• 2	I	8	17

Again the concentration rose slightly in the last few weeks; a similar rise was found by Bibb (1941) and Mull and Bill (1945) and a greater rise by Plass and Matthew (1926).

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As might be expected from the independent variations of haemoglobin and serum protein in non-pregnant adults, there was little evidence of correlation between the concentrations of haemoglobin and of serum protein in individuals; but the coefficient of regression of haemoglobin on albumin was significant (l=8.1, n'=74). In individuals who were followed through pregnancy, the fall in serum protein was relatively slight if the fall in haemoglobin was slight and vice versa.

Fall of haemoglobin between early and late pregnancy.

10 cases under 5 per cent Haldane.

6 cases over 5 per cent Haldane.

10 cases over 5 per cent Haldane.

10 cases over 5 per cent Haldane.

10 cases over 5 per cent Haldane.

10 cases over 5 per cent Haldane.

Of 18 cases with serum albumin under 4.0, 12 had a haemoglobin concentration below the mean for the corresponding period of pregnancy.

Postnatal. The concentration rose during the first week to a level slightly above that found during the early stages of pregnancy. In 14 cases the serum protein was estimated before and after delivery; in 9 it rose by not less than 0.3 g. per 100 ml. and in 1 it remained practically unchanged; in 2, bled 2 and 4 days after delivery, the concentration was lower than it had been before; 1 of these had a severe postpartum haemorrhage. This rapid rise was found by Plass and Matthew (1926) and by Mull and Bill (1945).

### Non-protein-nitrogen.

The mean N.P.N. was low from the earliest stages of pregnancy until shortly before delivery. In no case was the concentration above 39 mg. per 100 ml. In 16 cases that were followed through pregnancy the concentration rose by over 3 mg. per 100 ml. in 6, fell by over 3 mg. in 4, and remained approximately constant in the rest. After delivery the mean concentration rose promptly and did not rise further after the second half of the first week. In 12 cases, in which the N.P.N. was esti-

mated before and after delivery, the concentration rose by over 3 mg. per 100 ml. in 9. Our figures are very similar to those found by Pillman-Williams (1923).

#### Vitamin A.

Antenatal.Bodansky, Lewis and Lillienfeld (1943) and Lund and Kimble (1943) concluded that the concentration of vitamin A in the plasma fell during pregnancy. In our series there was no evidence of a fall after the early stages of pregnancy even among the subjects who were not taking supplements of vitamin A. However, in the series of Bodansky, Lewis and Lillienfeld (1943) the concentration was not reduced until the last month; the mean concentration in the 6th, 7th and 8th months was the same as in the first 3 months. As the largest number of their estimations was made in the last month the low figures found then overweight their mean for the third trimester. Lund and Kimble (1943) divided their cases into 3month periods and, therefore, did not detect that this sudden drop occurred in the last month only. In the present series the mean concentration throughout pregnancy was lower than the lowest concentration found among the non-pregnant women; while the mean concentration after the first week postpartum was approximately the same as that of the non-pregnant Women. Although the 2 groups are not strictly comparable it appears that the concentration of vitamin A was reduced from the early stages of pregnancy.

Lund and Kimble (1943) found that the fall tended to be less when the diet of the pregnant woman supplied enough vitamin A; when the women received 10,000 I.U. or more of vitamin A daily in addition to a good diet, the concentration in the plasma actually rose between the second and third trimester. One quarter of our subjects were taking supplements—either

cod-liver oil or vitamin A and D tablets; the proportion rose from about I in 6 in the first half of pregnancy to I in 2 in the last 2 months. On the whole (Table V) concentrations were higher in the sera of the

Carotenoids.

Antenatal. Bodansky, Lewis, and Lillienfeld (1943) found that the plasma carotenoids rose in the 6th, 7th, and 8th calendar month of pregnancy above the

Concentrations of Vitamin A (I.U. per 100 ml.) in the Plasma of those taking and those not taking Supplements of Vitamin A.

	Antenatal			Postnatal	
Period of pregnancy, weeks	Taking supplements	Not taking supplements	Days after delivery	Taking supplements	Not taking supplements
To 14	(2) 96.5	(5) 99.9	5- 7	(8) 138	(11)110
15, 16	(2)116	(15)115.2	8-14	(12)147	(19)131
17, 18	(1)110	(10) 95.3	14-63	(2)109	(7) 137
19-22	(4) 109	(10) 99.8			
23-26	(3)100	(7) 94.7			
27-32	(6) 101	(9) 92.9			
33-39-	(5) 106	0.001 (01)	*		

subjects who took the supplements. Among individual cases followed through pregnancy 8 did not take the supplements; the mean change between the first half and the last 3 months of pregnancy was -4.5 units per 100 ml. Nine took supplements; the mean change in the same interval was -4.7 units. However, of these 17 subjects, those who took the supplements had higher concentrations in their plasma than those who did not, not only towards the end of pregnancy but also before they began to take the supplements—which may be a matter of chance or evidence that those who took the supplements made a better choice of diet

Postnatal. The concentration of vitamin A rose immediately after delivery and remained high. In 13 cases examined before and after delivery the concentration rose by not less than 20 I.U. per 100 ml. in 12; in one, examined 9 weeks after delivery, the concentration had fallen. Higher levels were found among the subjects who were taking a supplement of vitamin A. Lund and Kimble (1943), Byrn and Eastman (1943), and Abt et al. (1943) found this rise after delivery.

level in the first 5 months and they fell in the 9th month. Lund and Kimble (1943) who pooled the results of the last 3 months, concluded that the mean concentration did not change with the period of pregnancy and that such variations as were found were due to changes with season in the amount of carotene in the food. The only significant seasonal difference that we found was that mean levels in early pregnancy were higher in September than in February and March. The mean concentration rose appreciably in the last trimester. In 17 cases estimations were made at different stages of pregnancy; in all but 3 the concentration was higher in the third trimester than it had been earlier. This rise was not accounted for by the seasonal changes.

Postnatal. The mean concentration of carotenoids fell after delivery, but remained above the mean levels found up to the 32nd week of pregnancy.

#### β-Carotene.

Antenatal. The proportion of  $\beta$ -carotene in total carotenoids varied widely, between 11 and 56 per cent, covering about the same range as found by other

workers (Willstaedt and Lindqvist, 1936; Lanzing, 1938). In one and the same individual the variation was much less. Out of 20 cases on which analyses were made more than once during pregnancy, the proportion of β-carotene fell in 10, remained within ±2.5 of the original value in 7, and rose by more than 5.0 in 3. One changed by 16, 2 by about 10, and none of the others changed by more than 8.5. There seemed to be little correlation with the change in the total carotenoids. Out of 15 cases in which the total carotenoids rose, the per cent value for \beta-carotene fell in 7 and remained unchanged in 6. A rise in total carotenoids of more than 50 per cent was associated with a fall in 3-carotene in only 3 cases out of 5. The proportion of β-carotene had a tendency to fall when the initial values were high and to rise when they were low.

Thus the means of the initial values in cases of a fall, no change, and a rise were, 33.1 (10), 27.1 (7), and 23.8 (4) per cent β-carotene, respectively.

Since most of the values for later pregnancies were obtained in March 1944 and April to July 1945—at which time the values for pregnancies of below 27 weeks' duration (mean=28.6,  $\varepsilon=1.35$ , n'=12) were slightly lower than those of September to December of 1943 and 1944 (mean=30.0,  $\varepsilon=1.38$ , n'=43)—seasonal variation may have contributed to the changes observed in these pregnancies.

Postnatal. Out of 13 cases from which data before and after delivery are available, the proportion of \$\beta\$-carotene in total carotenoids fell in 3, remained unchanged in 5, and rose in 5. The means of the initial values were 36.7, 25.2, and 23.6 per cent respectively; as in pregnancy the proportion rose when the initial value was low and fell when it was high. Comparison of the individual times at which these changes took place showed that a seasonal varia-

tion could not be held responsible to any appreciable extent. There were, however, significant differences between the mean values from all cases obtained in December 1943 to January 1944 (34.9, n'=12) and September to December 1944 (26.3, n'=18) on one hand and February to July 1945 1945 (20.9, n'=30) on the other. There was no relation between the change in the total carotenoids and that of the proportion of 3-carotene.

Ascorbic Acid.

Antenatal. Teel, Burke, and Draper (1938) found that the concentration of ascorbic acid in the plasma was considerably lower in the last trimester than earlier Elmby and Beckerpregnancy. Christensen (1938) also found a fall in concentration between the 5th and 9th month. Lund and Kimble (1943) found no change with the stage of pregnancy and considerable seasonal variation. Young et al. (1946) found no appreciable difference between the concentration in the first weeks and the last 4 weeks of pregnancy. In our cases the concentrations were relatively high in August, September and October (Table VI). During the remaining 9 months the concentration remained fairly constant. In 17 individual cases that were studied at different periods of pregnancy the changes in concentration found might be accounted for by this seasonal change in 13; the remaining 4 were taking supplements of fruit juice and the concentration in their plasma

The proportion of subjects taking this supplement of fruit juice rose as pregnancy advanced; the average concentration found among those taking the supplement was, as a whole, higher than among the rest (Table VI). But Table VII shows that not all those who took the supplements took the full amount. The answers of some of the subjects, when asked whether they

TABLE VI.

Ascorbic acid (mg. per 100 ml.) in the Serum of of Pregnant Women According to Time of Year and to taking of Supplement of Fruit Juice.

	Taking supplements	Not taking supplements
Aug., Sept., Oct.	(8) 0:73	(30) 0.68
Nov., Dec.	(6) 0.58	(20) 0.40
Feb. to May	(7) 0.66	(22) 0.50

were taking the supplements, appeared to be untrustworthy, for our records on this point do not wholly agree with those of the War-time Social Survey. Lund and Kimble (1943) considered that doses of ascorbic acid of the order of 25 mg. per day were of little benefit. The contrast between the effects of extra ascorbic acid in the diet during the summer months and that of the supplements is striking. We also found

relatively high concentrations of ascorbic acid in the serum during a week in February after there had been a distribution of oranges in the neighbourhood.

Postnatal. The concentrations found in the second week after delivery and subsequently were lower than those found during pregnancy. Higher concentrations were found as a whole among those taking supplements of ascorbic acid than those who were not. Concentration of ascorbic acid estimated in 9 cases before and after delivery fell in 7 cases; in 4 of these a seasonal fall might have been expected. The concentration rose in I and in I was already below o.1 mg. per 100 ml. before delivery. Lund and Kimble (1943) found a smaller reduction after delivery and Young et al. (1946) a reduction very similar to that found by us.

TABLE VII.

Amounts of Foodstuffs. Ounces per head per Week.

Stepney, 1944-45.

	,	Mean		Pregnant women pre-war (a)	Middle class women 1941 (b)
All meats		8.55	In 4 subjects under 5 ounces	21	16.1 (raw)
Bacon		1.7	4 had none; 3 had 2 ounces or less		3.9 (raw)
Fish		8.5	2 had none	7.7	5.1
Eggs (number)		2.8	r had none	3.5	3.2
Cheese	•••	1.3	3 had none; 4 had I ounce only	1.54	1.3
Milk		115.4		87	92
Milk pudding		18.0	5 had under 5 ounces		
Bread :		53.0	3 had under 63 ounces	49	45.6
Cake	•••	10.5	f had under 46% ounces  5 had under 10 ounces	19	11.7
Potatoes		39.2	I had only 2½ ounces  2 had 60 and 65 ounces	29.5	33
Potato chips		4.5	4 had none		
Root vegetables		3.9	6 had none	3.1	7.4
Green vegetables	•••	9.7	<pre>{ 2 had none 5 had about 15 ounces</pre>	17	13.9
Non-citrus fruit	• • •	10.6	3 had none;		
Fats Cod-liver oil		6.8		9.8	8.7
A and D tablets		1	I had 7 teaspoonfuls per week  ( I had 4		
Cod-liver oil caps	nles	}	2 had 7		
	uico	J	•		
Fruit juice		11.2	3 had none 3 had over 20 teaspoonfuls		

<sup>(</sup>a) McCance, Widdowson and Verdon-Roe (1938).

<sup>(</sup>b) Widdowson and Alington (1941).

Phosphatase.

Antenatal. Several authors, for example, Meranze, Meranze and Rothman (1937), Bodansky, Campbell and Bell (1930), Young et al. (1946), have found little change in the alkaline phosphatase in the plasma with a steep rise in the last 3 months of pregnancy, similar to that found in our series. In II individual cases followed through pregnancy the phosphatase rose in all but I. Our mean levels were rather higher than those found by Young et al. by the same method; in 4 cases values above 10 were found during the first 24 weeks of pregnancy. These high figures were not associated with abnormal levels of any of the other blood constituents that were estimated. Very high values for no apparent reason were found by Ebbs and Scott (1940) in one pregnancy.

Postnatal. The mean concentration during the first week taken as a whole after delivery was even slightly higher than during the last 7 weeks of pregnancy. The mean concentration, after the second week was the same as found by Robertson (1941) in the serum of adults. Meranze, Meranze and Rothman (1937) also found the concentration high 7 to 10 days after delivery: Young et al. (1946) found lower levels than we did during the puerperium, with a return to the normal mean when the women were examined 6 to 12 months later.

#### DIET.

The diets of 10 of the women taken during a week were recorded and the composition was calculated from tables (Table VII) by the War Time Social Survey in the course of a survey of the diets of lactating women made in the adjacent borough of Shore-ditch. The best feature of these diets is the large amount of milk taken; only 1 had less than ½ pint per day, and she ate 107½ ounces of milk pudding in the course of the week; 3 had a pint or over per day. Several

of the women ate considerably less than their rations of meat, bacon, and cheese. In 2 instances the amount of bread and cake (86%, III% ounces) eaten exceeded the present rations for pregnant women. The amounts of potatoes and vegetables eaten were unexpectedly low.

The amounts of nutrients taken (Table VIII), with the exception of calcium, vitamin A, and ascorbic acid, were low. The amount of preformed vitamin A was kept up to a basic level of over 1,000 I.U. per day by fortified margarine and by milk; in 14 instances it was high, as supplements were taken. All but one of the 7 subjects who took the supplement of fruit juice got over 50 mg. of ascorbic acid per day; the one exception took only 8 teaspoonfuls of fruit juice, less than the average amount of potatoes, no root vegetables and 3 ounces only of green vegetables.

The diets compare favourably with the diets of pregnant women studied by McCance, Widdowson, and Verdon-Roe (1938) in respect of the amount of milk and, in consequence, of calcium. In that series 63 per cent of all the women and 27 per cent of those in the wealthiest group took less than half a pint of fresh milk per day; the mean intake of calcium in the wealthiest group was 0.94 g. per day, and 80 per cent of all the women took less than 0.78 g. The diets were very similar to those of middle-class women in 1941 (Widdowson and Alington, 1941), but contain more milk and supply more animal protein and calcium.

#### DISCUSSION.

The changes in the composition of the blood that we have found have been very similar to those found by other workers. However, in most other investigations, not more than two constituents have been measured in the blood of the same subject. The most remarkable feature about these changes is that the same changes at the

TABLE VIII.

Nutrients per day in the diets of pregnant women, compared with those in the diet of pregnant women before the war (McCance, Widdowson, and Verdon-Roe, 1938) and middle-class women in 1941 (Widdowson and Alington, 1941), and composition of blood.

				1									
									Blood		Serum	um	
Week	Animal protein g.	Fat 8.	Calories	Calcium g.		Iron Vitamin A mg. Í.U.	Carotd. I.U.	Ascorbic acid mg.	Hb. per cent	Protein g./100 ml.	Vitamin A I.U./100 ml.'	Carotd. µg./100 ml.	Carotd. A-corbic ng./roo acid ml. mg./roo
	3 38	71	1,825	0.86	14.6	1,024	1,383	19	84.5	6.9	92	118	0.77
	333	& 6	1,822	1.19	11.9	5,594	3,249	115	89.4	ۍ د د	151	143	0.57
, Dec., 1943 5 Dec., 1943	3 27	2 2	1,791	0.66	10.6	1,200	718	39	83.2 88.4	6,4 6,4	118	8 6	0.38 0.34
	3 42	92	2,448	0.97	14.7	1,877	1,641	75	84.1	7.2	93	. 66	0.31
	4 28	62	2,044	0.92	10.5	1,033	406	41	120.0	. }	II4	51	0.41
15 Jan., 194,	4 59	8.4	2,075	1.06	9.6	4,262	2,341	80	86.5	6.8	118	. 89	0.22
	4 44	8	2,060	1.37	9.4	1,622	293	19	102.0	6.9	114	175	0.25
	4 35	90	2,292	1.16	10.8	3,564	1,443	34	93.6	6.5	145	103	0.36
5 Jan., 194.	.4 34	118	3,287	1.00	15.3	5,490	474	101	91.0	6.8	138	16	0.64
Mean	37.7	83.5	2,177	1.03	11.7	2,702	1,201	66,1	92.3	6.8	117	66	0.43
Pregnant women pre-war	.+3	96	2,330	0.68	12.4							<b>:</b>	<u> </u>
Middle class	33.8	78.4	2,137	0.77	12.2								
Requirements National Research Council U.S.A	•		2,500	i.5	1,5	6,000	٥	100					

same stages of pregnancy have been found by different investigators at different times and in different parts of the world. Thevarious constituents of the blood change at different stages of pregnancy and in different directions. The non-protein nitrogen falls in the earliest stages and rises after delivery; the haemoglobin and serum albumin fall sharply after the 20th week and rise gradually after delivery; the vitamin A (according to Bodansky, Lewis and Lillienfeld, 1943) falls and the carotenoids rise at the very end of pregnancy when the haemoglobin rises slightly; after delivery vitamin A rises and carotenoids fall: the phosphatase rises in the last 3 months. These changes cannot be ascribed solely to failure to maintain the concentrations as the volume of the blood increases. Defects in the diet cannot cause them all but may exaggerate some.

As the diet of rosubjects only was studied it was not possible to draw any conclusions about the relation of the composition of the blood to that of the diets of these subjects. But some conclusion can be drawn from the levels found in the whole group.

The low mean level of haemoglobin and high incidence of anaemia found by Hamilton and Wright (1942) among women treated with large doses of iron show that deficiency of iron in the food is not the only factor that causes anaemia, even if the concentration of haemoglobin has any relation to the amount of iron in the food, when this lies within the limits found in any ordinary diet. The low levels found by Hamilton and Wright (1942) in 1941 and 1942 when the food supply was at its worst and the improvement found by Roscoe and Donaldson (1946) between 1942 and 1944 when the food supply improved suggest that the level of haemoglobin is an index of the state of nutrition. This is borne out by the reduction found by Fleisch (1947) in Switzerland when the food supply was

at its lowest level. Ebbs, Tisdall and Scott (1941) found that anaemia was less common when the food was improved, without other changes in the standard of living. Young et al. (1946) found no relation between haemoglobin and income such as had been found by McCance, Widdowson and Verdon-Roe (1938) before the war; but the quality of diet varied much less with income in 1943–1945 than it did before the war.

The amount of phytic acid in flour has been increased since the rate of extraction of flour was raised in the spring of 1942; this increase does not appear to have affected the haemoglobin level in 3 years.

#### SUMMARY.

1. The bloods of a series of women attending the antenatal clinic of the London Hospital were examined. Haemoglobin was estimated in whole blood and iron, total protein, albumin, vitamin A, carotenoids, ascorbic acid and alkaline phosphatase in serum.

2. Haemoglobin was estimated photoelectrically and visually, according to the Haldane-Gowers method. The means of series of estimations agreed fairly well; but 45.6 per cent of individual readings differed by not less than 5 per cent and 8.7 per cent by over 10 per cent.

3. The mean concentration of haemoglobin fell as pregnancy advanced; the curve was similar to that found by others. The mean concentration rose after delivery.

4. The mean concentration of iron in serum did not change during pregnancy; it bore no relation to the concentration of haemoglobin.

5. The total serum protein fell as pregnancy advanced; the serum globulin remained approximately constant; the curve of fall of serum albumin was roughly parallel to that of haemoglobin.

6. The non-protein-nitrogen in serum

was low from the earliest stages of pregnancy and rose after delivery.

- 7. The mean concentration of vitamin A in serum was below the level found among non-pregnant women. No significant change occurred after the early stages of pregnancy until after delivery, when the concentration rose to the mean level found among non-pregnant women.
- 8. The mean concentration of carotenoids rose at the end of pregnancy and fell after delivery.
- 9. The proportion of β-carotene in total carotenoids in serum was estimated; it was found to vary widely. The variation in the serum of any individual during pregnancy and after delivery was much less and changes in the proportion bore no relation to the stage of pregnancy.
- . 10. No significant change in the concentration of ascorbic acid was found during pregnancy. The concentrations were higher in the months of August, September, and October, than in the spring.
- and ascorbic acid in sera of women taking vitamin supplements were higher than in the sera of those who were not taking these supplements, but the highest mean concentrations of ascorbic acid in serum were found in those months in which the amounts in the diet are highest.
- 12. The serum phosphatase rose at the end of pregnancy and fell after delivery.
- 13. The diets of 10 of the women were studied by the War Time Social Survey. The amount of milk consumed was higher than the amount found in a survey made before the war.

We have pleasure in thanking Mr. R. Alan Brews, F.R.C.S., for permission to examine the women attending his clinic; Vitamins Ltd., for payment of a technical assistant, and the Social Survey for permission to publish the survey of diets.

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### The Action of Intravenously Injected Sex Hormones and other Substances on the Blood Flow in the Human Endometrium

BY

#### ALFRED A. LOESER, M.D.

MENSTRUATION is a vascular phenomenon and the reaction of the vessels to hormonal influences is clinically of fundamental significance for the normal menstrual flow.

Up to now observations on the reaction of the vessels in the human endometrium after injection of sex hormones have not been possible, and nothing is known about the actual blood-flow in the human, endometrial, vascular bed under the influence of sex hormones, although the excellent papers of Markee (1932a, 1932b, 1938) and Daron (1936) gave valuable information about menstruation in intraocular endometrial transplants in the *Macacus rhesus*.

An attempt is made in the following experiments to elucidate the mode of production of the vascular changes in the human endometrium exposed to the immediate action of intravenously injected sex hormones.

Two questions arise: (a) Can we produce by injection of sex hormones a sudden change in the blood-flow—vasoconstriction or vasodilatation—of the endometrium?

Only intravenous injection of sex hormones can bring about an effect which can be observed at once. Sex hormones in high dosage for intravenous injection are usually not available. Dr. Hewett of Organon Laboratories has produced for my purpose highly concentrated solutions of sex hormones in Propylene Glycol which can, with no untoward effects be injected intravenously, and which bring about immediately observable clinical effects.

(b) Can we examine and, still more important, can we measure exactly in the human endometrium the mode of production of these vascular changes?

Method of Recording Uterine Vascular Changes.

An instrument was constructed in collaboration with Mr. A. Schallamach, F.Inst.P., resembling in principle the apparatus used by Richards, Wolf, and Wolff (1942) in their studies of the bloodflow in the human gastric mucosa. The instrument (Fig. 1) consists of a long rubber catheter, the eye of which is covered by a balloon into which thermocouples have been introduced: when deflated the balloon

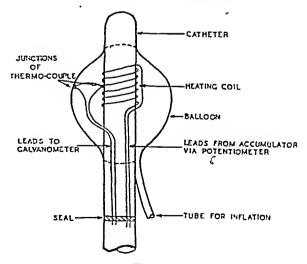


Fig. 1.

Diagram of uterine catheter used to record endometrial blood-flow.

(For description see text)

forms a tightly-fitting sleeve round the eye of the catheter. The balloon can be inflated with 4 to 5 ml. of air injected into the catheter. A small heating coil of about 10 ohms' resistance is wound round the catheter at the centre of the balloon; the leads from this coil are brought out respectively through the eye of the catheter and through an airtight seal at the other end of the catheter. The coil is connected via a potentiometer to a 2-volt accumulator. One, 2 or 3 differential thermocouples are present in the balloon; one junction from the thermocouples is moulded into the wall of the balloon and the other is attached to. but electrically insulated from, the heating coil. The two junctions are connected by means of a constantan wire. 3 inch long: the other leads from the thermocouple are brought out in the same way as the heating coil leads, and are connected to a galvanometer of low resistance (10 ohms). Any difference in temperature between the heating coil and the balloon results in the passage of a thermo-electric current through the galvanometer. The arrangement described, because of its low resistance, has a high sensitivity and responds to temperature changes of the order of 0.02°C. In practice, this degree of sensitivity was often found to be excessive, and was then reduced by means of a resistance in series with the galvanometer.

The catheter is introduced into the uterus with the precautions described below. A constant current is passed through the heating coil, thus raising the temperature of the wall of the balloon. Heat is lost from the balloon by conduction to the endometrium, with which the balloon is in intimate contact. The rate of heat loss is directly proportional to the blood-flow through the endometrium. The equilibrium temperature-difference between the heating coil and the balloon is indicated by the deflection of the galvanometer. When the blood-flow

increases (dilatation) there is more rapid heat loss from the coil, and the galvanometer is deflected in a certain direction: with decreased blood-flow (constriction) the deflection is in the opposite direction. The extent of the deflection is a measure of the magnitude of the change in blood-flow that is taking place. The galvanometer deflections were noted down at short intervals. It has not been possible to calibrate the deflections in terms of actual blood-flow: the vascular changes are therefore recorded in terms of mm. of deflection. As already mentioned, the method employed records changes of blood-flow, but it should be emphasized that it gives no information about the actual volume of blood present at any moment in the endometrium.

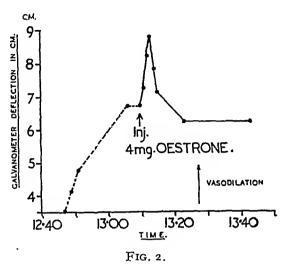
### Method of Clinical Experiment.

The catheter, before it is introduced into the uterus, is disinfected with Dettol cream. The cervix is pulled down with a vol sellum and if necessary dilated to Hegar No. 7. In multiparae the catheter slips into the cervical canal without previous dilata-As soon as the end of the catheter comes in contact with the fundus of the uterus, the balloon is inflated with not more than 4 to 5 ml. of air. If more air is used the endometrium may be compressed, and its circulation is impaired. No uterine contractions are produced, and the patient feels quite comfortable placed in the lithotomy position. Usually the observations can be completed in one hour.

With the instrument in the uterus, and the balloon blown up, heating of the coil is started. The galvanometer needle is slowly deflected, and finally comes to rest (Fig. 2).

In the steady state very small excursions (I to 2 mm. on the scale) constantly occur, which may be due to minute spontaneous fluctuations in vascular tone. When heating of the coil is stopped, the galvanometer

needle gradually returns to its original starting point.



Effects of oestrone on endometrial blood-flow. Heating of coil in balloon began at 12.47 p.m.; at 1.6 p.m. the galvanometer attained a steady state. At 1.10 p.m. injection of 4 mg. of oestrone given intravenously. Marked initial vasodilatation followed by recovery and secondary constriction. [Upward deflection=vasodilatation.]

### Injection of Drugs.

When an experiment is being performed, 5 to 10 minutes are allowed to elapse until the galvanometer needle is steady. The patient is then informed that an intravenous injection is about to be given. As soon as she feels the prick of the needle and the upward flow of the injected material, vaso-constriction often occurs as part of the emotional reaction. Such vasoconstriction may also occur even if no injection takes place. Patients who have become familiar with the procedure showed no vascular changes until the injected material produced its characteristic effects.

Intravenous injection was always employed. The sex hormones were injected in high concentrations dissolved in propylene glycol; control injections of the propylene glycol (up to 10 ml.) alone have no untoward effects. The substances

investigated and the maximum doses used at one injection were:

Oestrone, 10 mg.; oestradiol, 20 mg.; stilboestrol, 150 mg.; progesterone, 100 mg.; testosterone propionate, 250 mg.; adrenalin, 0.1 mg.; prostigmin, 1.0 mg.; pituitrin, 3 units; pitocin, 5 units; calcium gluconate, 20 ml. of a 20 per cent solution; nicotinic acid 50 mg.

When sex hormones were injected, 5 ml. of blood were first withdrawn into the syringe and mixed with the hormone solution which has a viscid, mucus-like consistency. If this precaution is not taken, and the injection is made without previous mixing with blood, the patient feels pain running up the arm to the shoulders. During the injection of sex hormones, the patient generally, but not invariably, feels a hot stream running up to the shoulder; she then tastes something sweet (propylene After 0.5 to 1 minute, she complains of marked heat in the vulva and vagina; the hot feeling spreads to the external genitals, especially round the clitoris, if large amounts of hormone are injected. All these symptoms disappear within 2 to 5 minutes. No changes were seen in the nasal mucous membrane, but the skin of the face is sometimes flushed for a few seconds, much more so with oestrogens than with progesterone testosterone. When testosterone is injected in doses of 100 mg. or over, there is, in addition to the hot feeling in the vagina, a severe itching in the vagina and round the vulva. The patient wants to scratch the part and the symptoms are those of an embarrassing pruritus.

As the effects develop very quickly, the vascular responses must be noted from the moment of injection. The best arrangement is for one person to give the injection slowly during a period of I to 3 minutes, while an observer records the galvanometer deflections.

Results.

Experiments with oestrones, oestradiol and stilboestrol—12 experiments on 9 patients.

Patient 1. Normal genitals; normal 28-day cycle; experiments during luteal phase. Injection of oestrone 0.5 m.g.; no vascular change. Injection of 20 ml. of a 20 per cent calcium gluconate solution; no change.

Patient 2. Normal genitals, normal 28-day cycle; experiments during oestrogenic phase. Injection of oestrone 1 mg.; no change. Injection of pitocin 1 ml. no change.

Patient 3. Normal genitals; normal menstrual cycle; experiments on the 24th day of the cycle. Injection of oestrone, 4 mg.; the results are summarized in Fig. 2, and show marked initial vaso-dilatation during the first 3 minutes; the effect passed away completely during the next 12 minutes, when some slight vasoconstriction developed.

A second experiment was performed on the same patient on the 16th day of the cycle. Injection of stilboestrol, 5 mg.; no effect. Injection of adrenalin, o.r mg.; a marked vasoconstriction within 2 minutes, which persisted for 30 minutes, when the observations were discontinued.

Patient 4. Normal genitals; normal menstrual cycle; had one child 12 years previously and wants another baby. Experiments 12 days after the period. Injection of oestrone, 5 mg.; vasodilatation develops within 6 minutes. Injection of pituitrin, 0.5 ml. marked vasoconstriction within 2 minutes, which lasted for 12 minutes, when the experiment was discontinued.

A second experiment was performed on the same patient 16 days after the last period. Injection of stilboestrol, 50 mg.; 4 mm. of vasodilatation developed in I minute. Injection of prostigmin, 3 mg.; immediate vasodilatation, reaching its maximum in 3 minutes, and persisting for 12 minutes, when observations were discontinued.

Patient 5. Unmarried medical student, with menstrual bleeding only 2 or 3 times a year; last bleeding 4 months previously. Injection of oestradiol, 2.5 mg.; slight vasodilatation (9 mm.). Endometrial biopsy showed a poorly developed oestrogenic endometrium.

Patient 6. Married woman; childless; periods of amenorrhoea of 5 to 7 months; last bleeding 6 weeks

previously. Injection of oestradiol, 5 mg.; no response. Endometrial biopsy showed a very thin endometrium, with glands corresponding to the normal cycle on the 6th or 7th day.

Patient 7. Married woman; childless; no menstruation for 10 years. Cyclical hormone treatment with oestrogens and progesterone had produced artificial bleeding in previous years. Injection of oestradiol, 25 mg., no effect. Injection of nicotinic acid, 50 mg.; no result. Biopsy showed a completely atrophic endometrium.

Patient 8. Four weeks after childbirth, nursing the baby; no menstruation since the confinement. Injection of oestrone 5 mg.; slight vasoconstriction (8 mm.) within 3 minutes.

Patient 9. Married; suffers from menorrhagia; 28-day cycle; bleeding period, 10 days. Experiments 18 days after last period. Injection of oestradiol, 5 mg.; vasodilatation of 10 to 20 mm. developed within 2 minutes. Injection of oestradiol 25 mg. 25 minutes later a similar (no greater) response was obtained. Repetition of the injection of 25 mg. of oestradiol on another occasion on the 12th day after the end of bleeding gave the same response as on the first occasion.

Conclusion. Oestrogens in doses of 2 mg. or more produce more or less marked temporary vasodilatation in the endometrium. When the endometrium is poorly developed the response is less pronounced. When the endometrium is completely atrophic (secondary amenorrhoea of long standing) Stilboestrol no vascular change occurs. was less active than the natural oestrogens. Pitocin is without effect; pituitrin and blood-vessels adrenalin constrict the rapidly, markedly, and for a long time.

Experiments with Progesterone (4 experiments on 3 patients).

Patient 10. Normal genitals; 28-day cycle; experiment on 20th day of the cycle. Injection of progesterone, 100 mg.; vasodilatation (15 mm.) within 7 minutes which remained unchanged for nearly 20 minutes.

Patient 11. Normal genitals; menorrhagia; 26-day cycle. Injection of 100 mg. of progesterone; very slight dilatation (5 mm.) for 10 minutes.

Injection of 50 mg. of stilboestrol; very temporary dilatation (3 mm.).

Patient 9. As above—experiment on 13th day of cycle. Injection of 100 mg. of progesterone; vasodilatation (20 mm.) within 5 minutes.

Second experiment during luteal phase 3 days before the onset of the period. Injection of 100 mg. of progesterone; slight dilatation (4 mm. only). Injection of 5 mg. of oestrone 10 minutes later: further dilatation for 6 mm.

Conclusion. Progesterone seems to have a small vasodilator effect.

Experiments with Testosterone propionate (8 patients).

The solution employed contained 12.5 mg. of the hormone in 1 ml. of propylene glycol..

Patient 12. Normal genitals; 28 day menstrual cycle; one child; last period 11 days previously. Injection of 125 mg., initial dilatation for 1 minute followed by a slow vasoconstriction reaching a level of 11 mm. after 30 minutes and persisting for another 30 minutes. Injection of 1.5 mg. of oestrone (1 hour after testosterone); no effect.

Patient 13. Normal genitals; 28-day menstrual cycle; injection given on 14th day of cycle.

Injection of 125 mg. followed by a second injection of 125 mg. 18 minutes later (see Fig. 3): slight initial vasodilatation followed by vasoconstriction which was intensified by a second injection.

Patient 14. Normal genitals; 28-day menstrual cycle; dysmenorrhoea membranacea; last period 14 days previously. Injection of 125 mg.; after 6 minutes vasoconstriction developed (maximum 10 mm.) which persisted for 30 minutes.

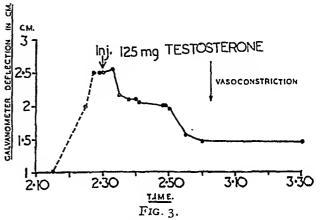
Patient 15. Normal genitals; 28-day menstrual cycle, dysmenorrhoea; last period 25 days previously. Injection of 125 mg.; after 6 minutes vasoconstriction of 13 mm. Injection of adrenalin (0.1 mg.) 12 minutes later; vasoconstriction of 40 mm. (greatest observed in this series) which was still present 20 minutes later.

Patient 16. Menorrhagia; curettings showed cystic proliferation of the endometrium; last period 9 days previously. Injection of 125 mg.; slight vasoconstriction of 3 mm. Injection of 1 mg. of ocstrone; slight vasodilatation.

Patient 17. Normal genitals; 28-day menstrual cycle, menorrhagia. Curettage 14 days previously. Injection of 125 mg. No vasoconstriction during subsequent 30 minutes.

Patient 18. Normal genitals; 26-day menstrual cycle, menorrhagia. Last period 24 days previously. Injection of 125 mg. Slight vasoconstriction of 5 mm.

Patient 19. Fourteen days after miscarriage. Injection of 125 mg. Slight vasoconstriction of 5 mm.



Effects of testosterone propionate on endometrial blood-flow. Heating of coil in balloon on catheter begun at 2.15 p.m. At 2.27 p.m. the steady state is attained. At 2.30 injection of 125 mg. of testosterone propionate given intravenously; repeat injection at 2.48 p.m. Note vasoconstriction.

[Downward deflection=vasoconstriction.]

Conclusions. Testosterone propionate generally has a vasoconstrictor effect after an initial temporary dilatation; the degree of vasoconstriction is variable but is not dependent on the phase of the menstrual cycle. The vasoconstriction lasts longer than the vasodilatation produced by oestrogens. The itching effect in the external genitals was marked in all cases and was worse when larger doses of testosterone were injected; it disappeared after a few minutes

#### Discussion.

No previous studies appear to have been made of the blood-flow in the human endo-

metrium and of the effect of sex hormones on the endometrial vascular bed. Robson and Schild (1938) examined the effects of drugs on the blood-flow and activity of the whole uterus in animals: different species reacted differently. Markee (1932a, 1932b) examined the vascular changes in the rabbit's uterus and in endometrial transplants. Reynolds and Foster (1939a, 1939b, 1940a, 1940b) examined the peripheral vascular action of oestrogens in men and in the ear of rabbits and found a vasodilator effect. Carloni (1930) noted that oestrogens dilated the capillaries of the nail bed. Reynolds and Foster found that oestrogens dilated the minute vessels of the skin and nasal mucosa in women, but the rate of bloodflow was not increased.

The mode of action of the sex hormones on the blood-vessels is undetermined. They may act directly on the vessel wall or indirectly through other mechanisms. It should be remembered that intravenously injected sex hormones are quickly destroyed in the blood and are also rapidly eliminated by the liver.

The vascular effects produced in women have been recorded and summarized above. In 7 instances curettage of the uterus was performed not later than I hour after the experimental injections; as might have been expected no vascular changes were visible in the histological specimens.

In a patient in whom 125 mg. of testosterone propionate were injected during an abdominal operation, blanching of the uterus was produced within 3 minutes and persisted for about 6 minutes.

It is worth emphasizing that both adrenalin and pituitrin produce much more lasting vascular effects than do the sex hormones.

#### SUMMARY.

(1) An instrument is described by means of which changes in blood-flow in the endo-

metrium of the human uterus can be recorded. The method of using the apparatus is described.

- (2) The effects of intravenously injected sex hormones and other substances on the endometrial blood-flow were studied.
- (3) Natural oestrogens and to a less extent progesterone produce a vasodilator action; testosterone propionate produces predominantly a vasoconstrictor action. Stilboestrol has a trifling dilator action. Adrenalin and pituitrin have a strong and lasting vasoconstrictor action.

greatly indebted to Professor Wright (Middlesex Hospital Samson Medical School) for his help and advice, to Sir Henry Dale, F.R.S., for supplying me with the literature, to Dr. Schallamach, F.Inst.Ph., in collaboration with whom the instrument was devised, to Dr. Macbeth, of Organon Laboratories (London) for putting at my disposal the hormones in Propylene Glycol for intravenous injection, and to Dr. Coden and Dr. Kenig for the intravenous injections which they gave the patients.

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# Amenorrhoea Traumatica (Atretica)

BY

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UNDER the above name I shall describe a specific type of amenorrhoea which, in spite of its prevalence, has not yet found a fitting place and description in gynaecological literature.

Following complicated labour or abortion a stenosis or blockage of the internal os of the cervix may occur under certain conditions, thus producing amenorrhoea. This amenorrhoea is not functional but organic; ovulation continues but the uterus does not react and the endometrium remains in a state of inactivity. Hormonal therapy is neither reasonable nor effective, whereas simple removal of the blockage is sufficient to restore menstruation to normal.

The diagnosis and recognition of this type of amenorrhoea is therefore not merely of academic interest, but is also important in practical therapeutics.

Actiology. Stenosis may occur under the following conditions:

- (a) Curettage during the puerperium, because of a potential polyp or atony of the uterus.
  - (b) Curettage for a "missed" abortion.
- (c) Single, or repeated, curettage after a spontaneous or induced incomplete abortion.
  - (d) Curettage for a hydatidiform mole.
- (c) Severe postpartum atony without instrumental but with other mechanical interference (manual removal of placenta, intrauterine packing).

Anatomy. The degree of stenosis varies from case to case; from those with complete occlusion, in which even a thin sur-

gical sound cannot be passed, to a slight narrowing in which very little force is needed to pass the usual uterine sound. Clinical manifestations are not dependent upon the extent of narrowing.

Diagnosis. The outstanding feature is the absence of menstruation, though sometimes a slight "spotting" occurs. There may be pain in the lower abdomen and back coming on once a month, even in women giving no previous history of dysmenorrhoea. At the same time the patient develops the usual allergic or vegetative disturbances specific to her menstruation, such as eczema, headaches, rapid pulse, etc., apart from which she feels well. The basal body temperature is biphasic. Upon sounding a block is encountered at the level of the internal os. Bimanual examination is normal except for incidental findings such as myomata, etc., but there is definitely no diminution in uterine size.

Differential diagnosis. Many women suspect pregnancy, but the differential diagnosis is not difficult. It is important to differentiate between the traumatic type of amenorrhoea and the other known types, in order to avoid waste of valuable time on useless therapeutic measures. A careful history with the signs enumerated above serves to prevent error.

*Prognosis*. The amenorrhoea may persist for months and years. In most cases there is a minimal restoration of the uterine function which will not respond to hormonal therapy, even surgical intervention not exerting any prolonged influence.

Appropriate therapy, however, brings about a return of menstruation, which is not always of the same intensity and duration as previously. In such cases, lapse of time and extent of injury are of major importance.

Further observations are necessary in order to determine the extent of impairment of fertility.

Prophylaxis. In order to obviate the development of stenosis it is advisable to:
(a) Inspect the placenta carefully after delivery and, if there is any doubt as to its integrity, make a manual exploration of the uterine cavity; (b) use conservative treatment as far as possible in every case of early or late uterine atony; (c) evacuate the uterine cavity in cases of missed abortion as soon as diagnosed, without waiting weeks or months for spontaneous abortion to occur; (d) secure complete evacuation of the uterus in cases of spontaneous or induced abortion.

If the necessity for an intervention which might possibly cause amenorrhoea arises in spite of all precautions, the patient should be asked to return for a check 6 to 8 weeks later and should be instructed to avoid sexual intercourse meanwhile. If menstruation has not appeared, bimanual examination is not sufficient and a sound should be passed into the cervix to determine its patency.

Therapy. Treatment is surgical and not hormonal. Following suitable disinfection and bimanual examination to ascertain the size and position of the uterus, the cervix is gripped and an attempt made to pass a sound into the uterus. If resistance is met, the attempt is renewed with narrower surgical sounds which have been bent like the uterine sound. If one of these sounds succeeds in passing the obstacle, the cervical passage is gradually dilated, dilatation ceasing when difficulty is met (usually Hegar 7 to 8). This marks the end of inter-

vention, and menstruation will ensue at the proper time, namely 4 weeks after the last menstrual pains or at the end of the second phase of the basal body-temperature curve (provided that measurement of the latter commenced early enough).

If the stricture is so great that even a fine sound does not pass, the operation should be stopped. In most cases the slight mechanical irritation involved in this unsuccessful attempt will prove sufficient to initiate the onset of menstruation, with slight loss lasting a few days only, and returning at regular intervals. If the results do not satisfy the patient or the physician the attempt to pass the sound may be repeated following a period of observation.

Complications. Necessary as gentleness and care are in this measure, the use of a certain amount of force is inevitable. However, any exaggeration in this respect may lead to a perforation of the tissues. When this occurs the operation is immediately suspended and the patient is put back to bed, but may get up and walk about next day without fear of any complications.

Proposed name. Amenorrhoea traumatica, or amenorrhoea atretica.

#### CASE REPORTS.

The present account omits all reference to the initial cases, in which a suitable method of treatment was sought. The material used is restricted to the period since 1944. During the 3 years 1944–1946, 29 cases of traumatic amenorrhoea were dealt with. These were classified as shown below (Table I).

First place among the causes of traumatic amenorrhoea is taken by postpartum haemorrhage. It was considered important to ascertain the proportion in which the amenorrhoea develops following postpartum curettage, manual removal of the placenta or packing of the uterus after delivery. Unfortunately, the available

TABLE I.

Cases by Causes of Amenorrhoea.

Pregnancy complications	No. of cases	Curettage	Repeated curettage	Manual removal of placenta	Packing of uterus
Metrorrhagia postpartum	rr	7	2	r	ı
Missed abortion	7	Ġ	ı	-	~
Incomplete abortion	8	7	I	-	~
Procured abortion	2	Ī	I	_	
Hydatidiform mole	ı	I	-	-	~
	29	22	5	I	1

material cannot indicate percentages, not only because there is not enough of it, but also because in most cases the injury had been inflicted prior to the period covered by the report, and treatment only fell within this time; while certain cases had their confinements in other institutions and came to us only for subsequent treatment. Finally, it is not impossible that women injured in our hospital went elsewhere for subsequent treatment. During the years 1944-1946, our department carried out 13 curettages in childbed (5 of these women underwent later treatment for amenorrhoea), 71 manual removals of the placenta (I treatment), and 6 intrauterine packings (I treatment). So that it seems that postpartum curettage constitutes the chief factor in the development of traumatic amenorrhoea.

The following cases illustrate the course of the disease, its causes and cure.

Case r. Amenorrhoea traumatica following curettage in the puerperium.

L. R., nurse, aged 34. In 1940 she had an abortion in the second month and was curetted. In 1942 normal birth and manual removal of the placenta. On 15th May, 1945, a normal birth and puerperal fever. She was treated with penicillin and discharged after 7 weeks in hospital. A week later she came back with a considerable haemorrhage and a placental polyp was removed by curettage. She reported on 23rd April, 1946, complaining of amenorrhoea, pains once a month, nausea and headache. Her child had been weaned 7 months earlier. Examination showed

the uterus to be enlarged by a small myoma. Uterine sounding was performed on 28th April, 1946. A slight stricture was found at the level of the internal os. A fortnight later menstruation appeared, continued for 3 days (previously 4/28), and has been regular since. Nausea and headache have vanished.

CASE 2. Amenorrhoea traumatica due to repeated curettage during the puerperium,

I. A., aged 31, 2 normal deliveries. About a month after the second delivery she was admitted with a considerable haemorrhage. Curettage was performed and repeated 5 days later. On each occasion fragments of placenta were removed. Blood transfusion was performed twice. Readmitted on 18th July, 1944. Five months after the second birth, complaining of amenorrhoea. Slight discharge and pains were experienced every month. Uterine sounding was performed and the narrow internal os was dilated. Since then menstruation has been 3/28 (formerly 5-6/28) without pain. Last menstruation 15th September, 1946. Pregnant when seen on 17th November, 1946.

CASE 3. Amenorrhoea traumatica due to difficult removal of placenta.

B. H., aged 33. 1939: craniotomy followed by the development of a vesico-vaginal fistula. Four months later the fistula was repaired, after which menstruation recommenced. 1941: 5½ months miscarriage. 1943: incomplete abortion and curettage.

5th August, 1943, 5½ months miscarriage, 36 days after rupture of membranes and manual removal of a firmly adherent placenta.

Following this there was amenorrhoea. 26th January, 1944: attempted sounding produced a perforation. Thereafter menstruation was normal. 29th October, 1944, not yet pregnant; sound

passed without difficulty. 8th May, 1945: Rubin test positive. 16th October, 1946: induction of premature labour at eighth month, a week after intrauterine death of the infant. Since then, menstruation normal.

Case 4. Amenorrhoea traumatica due to intrauterine packing.

T. H., aged 33. Married 9 years. In April, 1940, she had a forceps birth and postpartum haemorrhage, which required packing of the uterine cavity and blood transfusion. Since then. menstruation has been absent. Intensive hormonal treatment had no effect. On 17th July, 1944, a uterine sound was passed. Two obstacles were found, one at the level of the internal os, and the second, more obstinate, at the height of 2 in. (5½ cm.). After passage was forced the sound penetrated to a depth of 3 in. (8 cm.). Dilatation up to Hegar 9 and curettage was done, no material being obtained. After this, menstrual pains were experienced every month and there was a slight pink discharge, but no menstruation. Hormonal treatment, diathermy and autohaemotherapy. were all tried but without effect. On 25th December, 1946, their was a second soundage, with similar findings and measures. A little material was withdrawn by curettage, and upon microscopic examination atrophied mucous membrane was found. Since then she has had 2 days of weak menstruation monthly. Her temperature is biphasic all the time. We are preparing to conduct a third soundage, leaving a swab soaked in sterile paraffin in situ for a day or two.

The cause which is second in importance is missed abortion. During the period covered by this report, 207 cases of missed abortion passed through our department and were treated by curettage. This number is very high, and can be accounted for by the exaggerated use of progesterone in cases of impending or commencing abortion. Cases of amenorrhoea following missed abortion numbered 7, but here, as well, it was impossible to calculate percentages for the reasons given above. In one case 1½ months had elapsed between the death of the ovum and the curettage, 3 months in another case; more than 4

months in 3 others; while in respect of the remaining 3 cases information was not sufficient.

The small number of cases does not allow any conclusions to be drawn as to a definite relationship between amenorrhoea and length of time during which the dead ovum remains within the uterus. More uncommon are cases of amenorrhoea following normal abortions (natural or induced) or mole. Of this group I shall quote only I case.

Case 5. Amenorrhoea traumatica due to curettage after incomplete abortion

D. S., aged 41, married 1/2 a year. Four years ago she had peritonitis suppurativa following appendicitis, later complicated by empyema. Operated on 3 times. During sickness and convalescence, menstruation was absent for 7 months, but afterwards returned. In June, 1946, there was a natural abortion in the third month followed by curettage at the Hadassah Hospital without complications. On 20th September, 1946, she was readmitted, stating that since curettage there had been menstruation. At the Sick Fund dispensary she had received Di-Menformon and Progestin treatment without effect. A slight left version of the uterus was found, with a myomatous node about as big as a plum on the right side, and slight enlargement of the right ovary. She was ordered to take her basic temperature for 2 months and to wait, in case menstruation returned meanwhile. Temperature was biphasic, the end of the second phase being marked on each occasion by menstrual pains, without loss.

On 18th November, 1946, she was admitted to hospital and sounding performed. A stricture was found at the level of the internal os. Dilatation to 6½ Hegar was performed, followed by curettage. Microscopic examination (by Dr. Casper) showed somewhat enlarged glands with no indication of secretion. Cyclic changes could not be observed.

On 30th November, 1946, there was blood for 1 day. On 19th December, menstruation for 3 days, preceded by temperature of 39°C. (102°F.), accompanied by considerable pains. On 14th January, 1947, there were 3 days of normal menstruation. Since then, menstruation has been normal.

RESULTS OF TREATMENT.

Mechanical treatment proved immediately successful in all save 2 cases. Menstruation reappeared in the same month. Table II shows the results.

In 18 cases normal menstruation was

August, 1945, incomplete abortion. Curettage was performed and repeated on 7th September, 1946, on account of continued loss of blood. A week later—3 days loss, and a fortnight later—4 days loss, since when no menstruation.

On 27th November, 1946, an attempted sounding produced a perforation. Since then there have

TABLE II.

Duration of Amenorrhoea and Results of Treatment.

Duration of amenorrhoea	No.	. of	cases	Normal menstruation	Нуротепотноеа	Delayed onset
3 months	-	5		3	I	1*
4-6 ,,		12	-	9	3	
7–12 ,,		5		4	I	-
· 1- 2 years		3	•	I	2	-
2-5 ,,		2		~	I	1
5-8,,		2		1	I	-
		29		18	9	2

<sup>\*</sup> Sounding unsuccessful, perforation of uterus.

restored, though in some it weakened in due course. There was an appreciable difference between the previous and the renewed menstruation in 9 cases, in several of which the mucous membrane was examined. Little material was removed, and this showed a characteristic picture on microscopical examination (by Dr. Casper). Besides the area in which cyclical phenomena were well developed and adequate, other areas were found in which only proliferation could be recognized, while secretion was inadequate; and other areas showed scar tissue changes and closed inactive glands.

In 2 cases menstruation in weaker form recommenced only after several months had passed. In 1 of these (Case 4), the amenorrhoea lasted for almost 5 years until sounding was performed. In a second, to be described below, sounding was unsuccessful and led to perforation.

Case 6. Amenorrhoea following repeated curettage.

N. D., aged 32, married 12 years. Previous history: therapeutic abortion, normal delivery (5 years ago), spontaneous abortion. On 5th

been pains for 2 days each month. Since 17th June, 1946, monthly menstruation lasting 3 days with small loss of blood.

Special attention should be paid to the following case, in which the sounding was effective and restored the menstrual cycle. Because of the renewed stricture, however, blood was retained within the uterus, thus producing haematometra. Only after the obstacle was dealt with a second time did the collected blood leave, since when menstruation has been normal. This case has been included in the column "normal menstruation".

Case 7. Amenorrhoea traumatica following repeated curettage.

B. B., aged 38, reported on 6th August, 1946, married 8 years, 2 previous deliveries. Induced abortion 6 months earlier, followed 2 weeks later by recurettage on account of strong haemorrhage. Menstruation absent since, but slight pains return every month. Pills and injections uneffective. Examination shows retroflexion of the uterus. Instructed to take basal temperature. 27th October, 1946, biphasic temperature. No menstruation. Soundage. At the level of the inner os the sound met with resistance and was forced

through. Depth of uterus 3 in. (7½ cm.). Dilatation to 7½ Hegar. 6th December, 1946, no menstruation. No change in basal temperatures. Second passage of sound, meeting with the same obstacles. After bursting the barrier blackish blood comes out of the uterus. Since then menstruation has been regular, lasting 2 days monthly.

In 2 cases the sound entered the abdominal cavity. In 1 of them (Case 3), menstruation appeared at the proper time and continued normally until interrupted by pregnancy. In the second (Case 6), it appeared in attenuated form, following a delay of 3 months. In 1 case (Case 8), we were unable to force the barrier and the measure was suspended. Menstruation appeared at the normal time and continued regularly as hypomenorrhoea. Twelve weeks later the measure was attempted again, but without success on this occasion too. The form of menstruation did not change.

CASE 8. Amenorrhoea traumatica due to curettage in puerperio.

H. G., aged 33, married 9 years, normal delivery 7 years before. Second delivery on 25th July, 1945. Three weeks later considerable haemorrhage, curettage (placental polyp). Since then menstruation has been absent. Pains monthly in the lower abdomen, lasting 2-3 days.

8th May, 1946. Unsuccessful attempt to pass sound.

20th May, 1946. Menstruation lasting 24 hours. 16th June, 1946. Menstruation lasting 2 days. 18th July, 1946. Menstruation lasting for 1½ days, with considerable pains.

29th July, 1946. Second attempt to pass sound, again unsuccessful.

Thereafter menstruation continued as described above.

In summing up it is necessary to stress the fact, emerging in Table II, that when amenorrhoea lasted up to a year, the ratio between normal and weak menstruation was 16:5. In cases where it continued longer the ratio was 2:5.

# PREGNANCY FOLLOWING AMENORRHOEA TRAUMATICA

The observation period of 3 years is too brief for any definite opinion to be expressed in respect of pregnancy following traumatica amenorrhoea.

It will therefore be sufficient to report the facts.

Up to the present, information is available on 10 cases of pregnancy, which constitute a relatively high percentage. In 6 menstruation was normal after treatment and prior to conception. In 4-it was weak. Two pregnancies have not yet reached their term. Two ended in natural abortion, 3 in missed abortion, 1 in death of the child within the womb in the eighth month. One birth was normal with manual removal of placenta, and 1 required Caesarean section.

The large proportion of irregular pregnancies is striking. Most cases showed grave irregularities in previous pregnancies as well, hence these phenomena do not need to be attributed purely to the effects of the measures taken.

#### DISCUSSION.

Amenorrhoea developing because of injury, and its simple treatment by passing a sound and dilatation, raises a number of questions the answers to which cannot, for obvious reasons, be supported by anatomical and histological examination of the affected organs. Any attempt to classify them can therefore be based only on theoretical assumptions.

The first question is how to explain the stricture in the vicinity of the inner os. The generally accepted view that undue or sudden force used in the dilatation preceding curettage may cause definite cervical injury, and that curetting the cervical canal vigourously will denude the opposed cervical folds, leading to agglutination and stenosis, might be correct in isolated cases,

but cannot serve as a general explanation. Our material includes 2 cases in which there was neither dilatation nor curettage, and 11 cases in which only curettage was performed. Apart from which the walls of the uterus, and not those of the cervix, are curetted.

In our opinion, under certain conditions, the uterus reacts to curettage by tetanic contractions, which may pass after a few moments or hours, but may also continue so long as to become permanent. The contraction of the circular muscles round the uterine os, causes the os to narrow at the close of any abrasion. In the cases under consideration here, prolonged spastic stricture becomes organic in the course of time. The mechanism may be compared to that which affects the blood vessels in toxaemia of pregnancy.

This pathological reaction of the uterus is the outcome of a graver injury than usual, such as repeated curettage or deep curettage for missed abortion (in which it is sometimes difficult to differentiate between organized placenta material and uterine muscle), or as a result of a normal or even very slight injury when the uterus has been harmed by large-scale haemorrhage.

The second question is: Is the mechanical factor of narrowing the uterine os sufficient to account for absence of menstruation? The reply would be in the affirmative if this mechanical factor were to inhibit the hormonic cycle, or if the blood were to accumulate behind the stricture with the development of haematometra.

The actual facts, however, point to neither one nor the other. The hormonal cycle is not affected and ovulation remains normal. In all cases basal temperature remains biphasic; and menstruation reappears punctually at the end of the second phase, if the obstacle is removed during the cycle. What is affected is the reaction of the uterus to hormonal stimuli. The inter-

esting phenomenon known as non-ovulating bleeding, in which regular menstruation appears despite absence of ovulation, has long been familiar. What has been described above is the precise antithesis, an absence of menstruation in spite of regular ovulation, a sort of "ovulating non-bleeding".

The endometrium remains in a state of entire quiescence for a long time, sometimes for years on end. It is restored to activity as soon as the sound is introduced into the uterus; sometimes even when nothing more is achieved than an attempt to introduce it.

This would be impossible without involving the nervous system; and we must assume that both inhibiting and restorative stimuli are transferred by the reflexes to the point where their effect is exerted. This hypothesis also makes it possible to understand the traumatic amenorrhoea which is occasionally met with from a different source, namely, the amenorrhoea following development of a vesicovaginal fistula, which vanishes rapidly after surgical repair of the fistula. In this connexion, mention should also be made of an analogous phenomenon in the field of urology; reflex anuria as a reaction to a stone in the ureter.

## AUTHOR'S ADDENDUM.

Some time after completing this paper I came across an abstract (published in the American Journal of Gynecology and Obstetrics, 53, 1060, 1937). The author has kindly supplied me with a copy of the original paper (Stamer, S. "Partial and Total Atresia of the Uterus after Excochleation", Acta Obstetrica and Gynecologica Scandinavica, 26, 263-297, 1946).

The author gives a brief review of 37 cases of uterine atresia published between the years 1894 and 1933, 20 of them by B. Bass in 1927, the others by a number of

authors, among them classics like Wertheim, Kustner, Fritsch, Veit, Halban and others.

To the above cases he adds and details 24 cases seen by him in the Gynaecological Department I of the Rigshospital in Copenhagen during the past 2 years. His conclusions are in many respects similar to mine. But his conception of the mechanism of atresia deserves some criticism.

Stamer believes that a too energetic abrasion removes a thin layer of the musculature and thus produces a condition favouring occlusion.

As I have pointed out above, we have to revise this old viewpoint, and have to find an explanation suiting not only the exceptional cases of mutilated uterus, but every case of stenosis and atresia following currettage, and this I have tried to do in the discussion.

Stamer believes that the menstrual flow continues undisturbed behind the blockage:

On exploration the uterus will sometimes prove to be enlarged by haematometra, but in most cases it will feel normal in size or even a little diminished. If the uterus is enlarged it means that it has not been able to get rid of the menstrual products formed every month. These products remain in the uterus and increase in amount from month to month, bringing about a distension of the uterus, which thus increases in size and thus may simulate a condition of pregnancy. In those cases in which the uterus is of normal size or a little diminished the menstrual products are every month evacuated into the tubes. Under such conditions no haematometra is formed, but why the uterus then often feels small is difficult to explain.

In most cases the tubes appear to be perfectly normal, but sometimes they are transformed into haematosalpinges, and all transitions may be encountered from slight thickening of the tubes to large massive intumescences which, in connexion with adhesions, may completely fill the pelvic cavity. In those cases in which the uterus evacuates its contents into the tubes, and the

latter evacuate the greater part of the contents through the abdominal ostium into the peritoneal cavity, the uterus and tubes will feel normal—or, as mentioned, the uterus will sometimes appear a little small. In these cases the menstrual products may be absorbed from the peritoneal cavity or—if the menstruation is more profuse—settle in the pelvic cavity, where eventually they may undergo organization and perhaps in certain cases give rise to the formations of adhesions.

In cases where the menstrual products do not pass out into the peritoneal cavity—either because of changes in the tubes as salpingitis and similar phenomena, or because the menstrual products contain some flakes too large to pass even through normal tubes, or a combination of both factors—haematosalpinges will result. If the obstruction to the passage is located laterally in the tubes, haematosalpinges will first develop, and later be followed by haematometra. If the obstruction is located medially in the tubes or even at the uterine orifice, only haematometra will result.

This description is in contrast to the real findings, even in Stamer's own cases. He never met a haematometra and only in 3 cases "a tender and soft intumescence of one adnex" and in 3 cases one adnex "a little thickened and tender." Bass, who published 20 cases of cervical atresia after induced abortion "never found the lesion associated with haematosalpinges or haematometra." The same applies to our cases.

Moreover, it is an indisputable fact that in the many instances when the endometrium was examined immediately after breaking through the atresia, no cyclic changes could be observed. We must, therefore, conclude that Stamer's supposition of the occurrence of menstruation is erroneous.

But for these differences, which mainly concern the mechanism of the disturbances, we have both reached the same conclusion, about diagnosis, treatment and the frequency of the disease hereby titled: "Amenorrhoea traumatica".

# Gross Hypertrophy of the Pregnant Uterine Cervix Simulating Cancer

BY

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This case is recorded because no description of anything like it has been found in the standard textbooks and, while expert pathological advice was unable to find any exact solution of its histological problem and the description is thus somewhat inconclusive, it is possible that similar cases may be brought to light and the condition accurately determined.

#### CASE RECORD

History. A woman aged 26, was seen in consultation on February 22nd, 1946, because of an unusual appearance of the cervix uteri, coupled with a blood-stained discharge, in the 36th week of pregnancy. She had had one normal previous pregnancy—which had resulted in the birth of a healthy boy in 1944. The second child was due on March 20th, 1946, and was not by her husband.

No history of any important disease was obtained, but in answer to a direct question it was admitted that a blood-stained discharge had been noticed in December, 1945, at about the 28th week of pregnancy. However, as there were no other symptoms, little attention had been paid to it and the pregnancy otherwise had progressed normally.

Examination. In appearance, the woman was of slight-build and rather pale, but made no complaint of illness. The fundus uteri was at a level appropriate for 36 weeks of pregnancy and the foetus appeared active, presenting by the breech with its back to the right. There were no toxic signs, and no evidence of cystitis or urethritis.

Vaginal examination disclosed no abnormality of the bony pelvis and no unnatural hardness

could be determined in the cervix, although its outline was definitely irregular. Viewed through a speculum, however, the cervix was grossly hypertrophied, showed numerous areas of ulceration exuding purulent material and bled freely at the lightest touch. Indeed, on excising a piece for biopsy, bleeding was brisk enough to require vaginal plugging, which was done with gauze soaked in Bonney's blue paint.

Diagnosis. A tentative diagnosis of cervical cancer was made on these clinical findings and the woman was admitted to hospital forthwith for further investigation and treatment.

Progress and Treatment. There was no fever and no further bleeding occurred when the vaginal plug was removed after 24 hours, although there was a markedly offensive discharge, which increased daily in quantity. X-ray examination confirmed the presentation of the foetus and disclosed no other abnormality. The Wassermann reaction and gonococcal fixation tests were negative, as were attempts to demonstrate the gonococcus by smear and culture. The blood count was normal.

Dr. Gleave, pathologist to the Royal South Hants Hospital, reported on the cervical fragment as showing gross hypertrophy unlike anything he had seen previously, but no clear-cut evidence of malignancy.

Thus, since clinical evidence, it seemed, would have to be relied upon in determining treatment, some organised plan was necessary and it was decided to examine the cervix under anaesthesia and repeat the biopsy, with provision and permission to proceed with Caesarean section as a preliminary to irradiation, if further evidence of maligancy was apparent.

Operation. On February 28th, under nitrous

oxide and oxygen anaesthesia, the cervix was again exposed with a speculum and was found to present a remarkable condition of septic hypertrophy so that the whole of the upper vagina was filled with an exuberant mass, oozing pus from many crevices and bleeding freely when touched.

A fragment as large as a sugar lump was excised before the vagina was packed, but, from the enormous increase in size of the mass in the 6 days since first examined, the presence of a neoplasm seemed certain and the risk of malignancy great enough to justify terminating the pregnancy forthwith by abdominal section.

Accordingly, Caesarean section was performed through a midline sub-umbilical incision, a classical uterine incision being preferred because of the possibility of neaplastic involvement of the lower segment. Ether was added to the gas mixture to procure sufficient depth of anaesthesia and there was moderate cyanosis of the child at birth. This, however, a male weighing 5¾ pounds, soon recovered and showed no defect. The placenta was normal in appearance and insertion and bleeding was slight. No invasion of uterine body, parametrium or glands was detected.

Puerperium. As unequivocal evidence of malignancy was confidently expected from the second biopsy, it seemed wise to avoid lactation and Stilboestrol 5 mg. daily for 10 days was given to the mother, together with a course of sulphathiazole amounting to 25 gm. This last was given with the object both of minimising the evident risk of intrauterine infection and also as far as possible to clear up the septic element of the cervical lesion preparatory to irradiation. Further smears and culture at this stage revealed a mixed vaginal flora with no evidence of haemolytic streptococci or gonococci.

Clinically, the puerperium was uneventful and there were no postoperative complications. Indeed, it was the obvious well-being of the patient and the rapid decrease of the discharge (even allowing for the effects of sulphathiazole) that instilled the first doubts as to the accuracy of the diagnosis. The pathological reports completed the dilemma.

Pathology. Dr. Gleave, reporting on the second biopsy fragment, again commented upon the remarkable degree of hypertrophy and said that in his opinion the condition was malignant, but, as there were unusual histological features, he would welcome other opinions. Through the good offices of the Pathological Advisory Committee, 3 eminent pathologists kindly examined the sections and a transcription of their reports is given together with reproductions of the slides, (Figs. 1 and 2). It will be noted that the votes for and against malignant disease were now level at 2-all.

Subsequent Progress. Again clinical judgment had the casting vote in the matter of action, but, read as a whole, the careful and detailed pathological opinions seemed to weigh against a diagnosis of malignancy and at least offered justification for withholding radical therapy for a further period of observation; a course which was borne out in practice.

Detailed re-examination of the cervix on March 21st, 1946, 3 weeks after operation, revealed rapid healing. The cervix was reduced to about a quarter of its former size and, although still oedematous and inflamed, it had regained its normal outline instead of presenting as an irregular proliferating mass. Slight bleeding occurred on touching it.

By this time, the abdominal wound was soundly healed and the infant thriving, so that, with the need of radical treatment much less likely, the woman was discharged from hospital.

Further examination on May 17th, 1946, 11 weeks after operation, showed that, but for some slight superficial erosion around the external os, the cervix was indistinguishable from normal. Biopsy of a fragment from the eroded area was reported as showing evidence of superficial inflammation, but no signs of malignant disease. The sections are reproduced in Figs. 3 and 4.

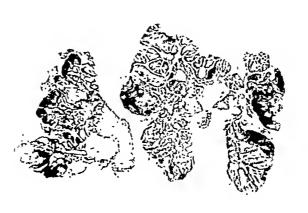
In view of the uncertain nature of the condition, the woman was advised to report for examination every 3 months, but unfortunately she soon left the district and, apart from the fact that she was alive and apparently well in June, 1947, no further information is available.\*

# CERVICAL CANCER IN PREGNANCY: A SUMMARY.

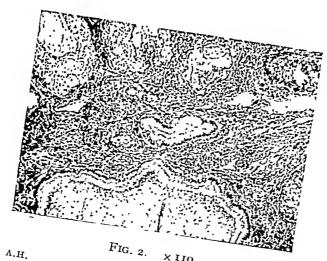
Pregnancy complicating cervical cancer is uncommon and the converse is probably very rare, the combined incidence of

<sup>\*</sup> See Addendum on page 35.

# CERVIN UTERI IN 37111 WEEK OF PREGNANCY.



 $F_{IG. I.}$ × 6.



× 110.

# CERVIX UTERI 78 DAYS POSTPARTUM.

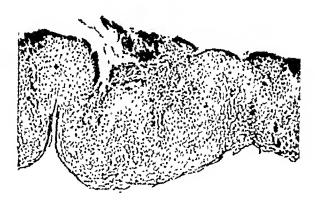


Fig. 3. ×110.



Fig. 4. × 110.

A.H.

growths being variously estimated as I in 2,000 (Sarwey, 1899) and I in 20,000 (Nielsen, 1933) pregnancies. As would be expected, multigravidae in the fourth decade show the highest incidence and the disease is very rare in first pregnancy, suggesting cervical trauma as a determining factor. Sarwey reports a case aged 26.

Persistent blood-stained discharge is the leading symptom and marked induration of the cervix (or part of it) is stressed by many as the most constant sign; Kerr (1937) recording a case in which the diagnosis was correctly made in the first instance on this finding alone. Biopsy, of course, offers the most exact method of detecting the condition

Opinion is divided as to whether pregnancy enhances malignancy, but its effects are probably much less than was thought formerly. In the absence of treatment, retrogression due to decreased vascularity in the puerperium might be expected.

Treatment largely ignores the pregnancy and is decided by the extent of the growth when first seen. If the foetus is not viable. abdominal hysterotomy avoids trauma and can be followed by radical hysterectomy or irradiation, as preferred. If the foetus is viable, Caesarean section precedes similar treatment of the growth. Only in cases where the cervix is dilated by the presenting part before the disease is recognized is vaginal delivery practised. Difficult cases where the foetus closely approaches viability have been successfully treated by temporary irradiation followed in a few weeks by Caesarean section and radical hysterectomy; Berkeley (1934) records such a case with both mother and child alive 20 years after operation.

As to whether radical hysterectomy or irradiation is selected for the actual lesion still remains a matter of individual preference. Radical hysterectomy is certainly less arduous and probably less dangerous than in non-pregnant cases, while irradiation is most effective when a combination of radium and X-rays is used and has a lesser primary mortality and a shorter convalescence than operation. The 5-year survival rate is about the same for both methods.

#### COMMENTARY.

Using the summary of facts just set out regarding cervical cancer in pregnancy to provide a background, the present case can be analyzed and such information as it offers in retrospect extracted.

To strike a balance of the diagnostic points, in favour of cancer were the persistent bleeding and the presence of a large and rapidly growing mass; against it were the woman's age and the absence of palpable induration in the cervix. Biopsy was neutral.

However, that the diagnosis was in error is now reasonably certain and the woman's escape from severe and unnecessary treatment may well have depended upon the puerperal administration of sulphathiazole, not wholly fortuitous, but certainly without fully realizing its possiblities. As it was, she suffered Caesarean section, which may, or may not, have been inevitable on purely obstetric grounds, but which might well have been delayed some weeks had the question of cancer not arisen.

What then was the nature and cause of the lesion? Infection is the obvious alternative to neoplasia, and it is worth noting that the absence of induration, although disregarded, held good as a physical sign, and that biopsy, even in most expert hands, was equivocal in its findings.

Professor Capell's comparison with papilloma virus lesions is interesting and worthy of further study, but, before discarding commonplace organisms, gonococcus and all its wiles must be remembered, despite negative cultures and

fixation tests. Indeed, if one somewhat fanciful explanation of the whole picture is allowed, it would be tempting to consider venereal papillomata (with or without their virus) as secondary phenomena in extinct gonococcal lesions and to represent the cervix in this particular case as an outsize lesion of this kind.

Such speculation, however, is of small value. Enough has been said to draw attention to an alarming appearance of the pregnant cervix, which lesion may be rare enough to merit publication in its own right, but which, if at all common, perhaps deserves some mention in the standard literature of reference.

#### SUMMARY.

A case is described of a multigravida, aged 26, in whom gross hypertrophy of the uterine cervix with blood-stained discharge led to an erroneous diagnosis of cancer in the 37th week of pregnancy.

Immediate Caesarean section produced a healthy child and rapid healing of the cervix following a puerperal course of sulphathiazole was noted. Equivocal biopsyfindings are recorded and the facts regarding cervical cancer in pregnancy are summarized.

The diagnosis points are reviewed in retrospect.

My thanks are due to Dr. H. Gleave, Pathologist to the Royal South Hants Hospital, for carrying out all investigations and for preparing the sections and to Professors M. J. Stewart, D. F. Cappell, and J. H. Dible for their kindness in examining the slides and giving detailed opinions, as well as to Dr. Shipley Stewart of Lymington in whose care the case was originally.

#### PATHOLOGICAL REPORTS

Professor M. J. Stewart.

"This [section] shows very notable proliferative

activity of both endocervical and squamous portions of cervix, but especially the latter. It is well differentiated squamous epithelium, but very active indeed, containing in places mitotic figures in large numbers. There is also very notable intermingling of squamous and glandular tissue due. I should say, to downgrowth of the squamous element, since many of the glands are apparently stretched out as a result of this overgrowth. Abundant signs of inflammatory change are present, including collections of pus, both within the lumen of some of the endocervical glands and also in relation to some of the squamous epithelium, while the stroma generally shows patchy infiltration by plasma cells and lymphocytes. I imagine that the existence of pregnancy may have a stimulating effect on proliferative activity in the cervix as elsewhere, but I am bound to say I think the squamous epithelial overgrowth here is not mere metaplasia, but neoplastic. Admittedly, there is direct continuity between the squamous epithelium and the glandular at many places, such as one sees in squamous metaplasia, but there is far greater evidence of proliferative activity in the squamous epithelium than I have ever seen in metaplasia. In addition, much of the deeper squamous tissue is irregular and the edge (stratum germinativum) is also irregular at many points. The most favourable aspect is the massive character of the proliferation, without small cellgroups infiltrating deeply beyond the general edge. Therefore, although I think the condition is most probably malignant, it is certainly not of the infiltrative type; but, as I say, I have no experience of the effect of pregnancy on the portio vaginalis cervicis."

## Professor D. F. Cappell.

"I do not think the cervix is the seat of malignant disease. There is quite an unusual amount of proliferation and thickening of the squamous-epithelial covering, and also, I think, an increase of the cervical mucous glands with abundant inflammatory infiltration. I do not feel satisfied, however, that the condition is neoplastic. The thickening of the epithelium reminds me of what one sometimes sees in the so-called "venereal warts" in spite of the negative G.C.F.T. I wonder if this could be an infection of the cervix with the papilloma virus which seems to be responsible for that condition."

Professor J. H. Dible.

"The section shows cervicitis, infection and marked squamous overgrowth and replacement of cervical glandular epithelium. There is hyperkeratisis and a quasi-polypoid overgrowth of cervical epithelium. I have never seen an exactly similar condition as far as I can remember. I can find no definite evidence of malignancy; the polymorph invasion of squamous epithelium is, perhaps, a little susupicious. I think in this case the clinical condition should be an important guide in view of the unusual and rather equivocal histological findings. In any case, the patient should be watched."

#### ADDENDUM.

Since this paper was written a further opportunity of examining the patient has

occurred, and on November 17th, 1947, her cervix appeared normal, save for some slight increased vascularity around the os. Biopsy showed no evidence of malignancy: a smear and culture failed to demonstrate any pathogenic organisms and the Wassermann reaction and gonococcal fixation test were negative.

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# An Accessory Growth on the Posterior Commissure of the Labia Majora

RV

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AND

ISABEL G. SMITH.

Department of Embryology, University College, London.

THE case investigated was that of a woman aged 26 years, who was a para I, seen at the Royal Salop Infirmary, Shrewsbury, 2nd November, 1946. She had previously had spontaneous delivery of a 6½ pounds living child on 29th March, 1946. There was no tear at the time of delivery and no stitches had been inserted.

Fourteen days after the delivery the patient felt a lump at the vaginal orifice. At first this made coitus impossible; later coitus, although possible, was difficult and at times painful.

At the time of delivery the midwife noticed a small lump posterior to the vaginal orifice but considered it to be merely a varicose vein. The patient had not noticed anything abnormal herself before the birth of the child.

Seen in hospital on 2nd November, 1946, the patient was found to have what appeared to be a small tumour, 1½ inches by r inch, situated in the centre of the posterior commissure. This appeared to be composed of rudimentary labia majora and minora with a pit between the labia minora representing a rudimentary vestibule or vaginal introitus. After photographing in situ, excision of the tumour was carried out on 13th November, 1946. (We are indebted to Dr. Vivian Barnett for the above case history and material.)

The gross structure was photographed for the macroscopic and morphological

appearances. It was then examined histologically for microscopic structure to see if any tissues characteristic of the vulva were present.

Histological Procedure.

After fixing in 10 per cent formalin the specimen was embedded in celloidin and paraffin wax and kept in 70 per cent alcohol. Sections of 45µ were cut with a sliding microtome and were laid in serial order on sheets of thin paper in 70 per cent alcohol. It was found that sections containing large pieces of tissue tended to crease rather badly, but most of the creases were successfully removed by soaking the sections in the following solution which softened the celloidin: Bergamot oil, Xylol, Origanum oil and Creosote (Cowdry, 1943).

One in every 10 sections, starting from the anterior end of the specimen, was stained with Erlich's haematoxylin and eosin, other sections of the specimen were stained by Wilder's method and Weigerts and Resorcin-Fuchsein for reticular tissue and elastic fibres respectively. Both were present.

Examination of the Growth.

Position of Growth.

The exact position of the growth on the perineum was determined by reference to the photograph of the structure *in situ*,

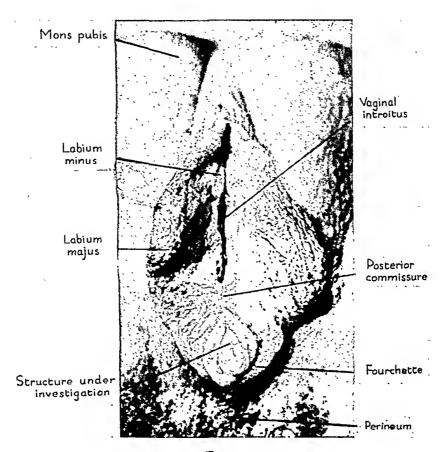
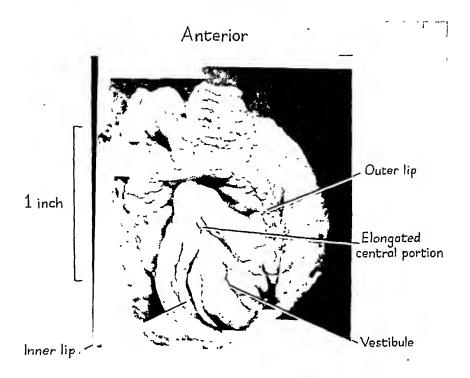


FIG. 1. Position of structure in situ.

G.R.B. & I.G.S.

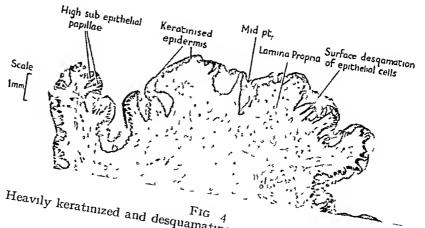


Posterior

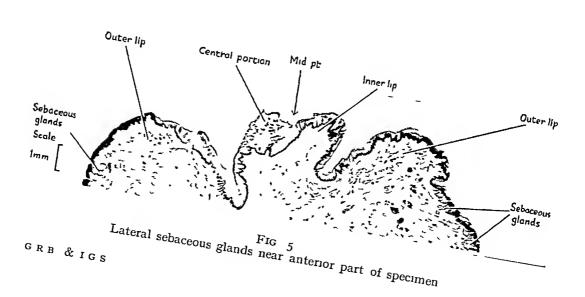
Fig. 2.

Morphological form of growth.

G.R.B. & I.G.S.



Heavily keratinized and desquamating stratified squamous epithelium



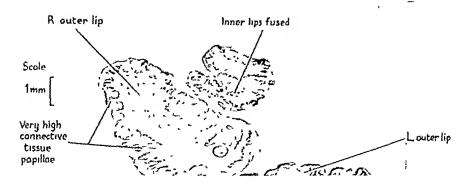


Fig. 6. Many high sub-epithelial connective tissue papillae.

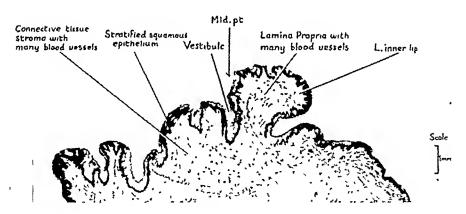


Fig. 7. Hypervascularity of lamina propria.

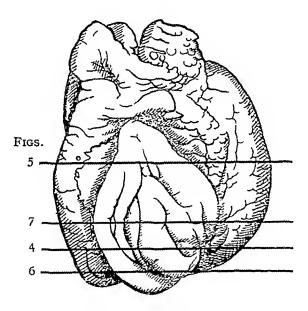
C.R.B. & I.G.S.

comparison with pictures of normal perineum (Novak, 1946) and by anatomical observation. It was situated in the middle of the fourchette of the posterior commissure (see Fig. 1).

Macroscopic Appearance of Whole Structure (see Fig. 3).

The structure under investigation was about  $1\frac{1}{2}$  inches long by 1 inch broad. It was roughly oval to circular in outline and had 2 large outer folds or lips. Within

#### Anterior



Posterior

Fig. 3. Key to levels of photographs of sections.

these lips there was a much folded pearshaped structure, the wider part of which was posterior. This inner structure was about 0.5 inches long and 0.4 inches from side to side at the widest part, tapering to about 0.005 inches anteriorly. It was separated from the rest of the growth by a deep infolding of tissue.

The central structure also exhibited

several folds or lips and had an elongated central portion which, from naked eye appearance, looked like a miniature clitoris.

Morphological Structure of Sections.

Each section was examined with a hand lens for gross structure and the level of sectioning was determined by reference to the photograph of the whole specimen. After examination by microscope 4

After examination by microscope 4 representative sections were selected for photography and their levels were marked on an outline tracing of the photograph (see Fig. 3).

Tissue Structure.

The specimen was covered all over by a very thick stratified, squamous epithelium, which, in parts, was heavily keratinized, and in others showed surface desquamation (see Fig. 4). The epithelial cells were closely packed, especially in the basal layer. Below this epithelium, in the lateral parts of the sections, were numerous sebaceous glands (see Fig. 5). These varied in size from a few small follicles to large multi-follicular glands, in various parts. No hairs were present anywhere throughout the structure.

The sub-epithelial tissue was very vascular and there were a great many large connective tissue papillae which pushed a long way into the stratified squamous epithelium. Many of these could be seen cut in transverse as well as in longitudinal section (see Fig. 6). The sub-epithelial tissue also contained a considerable amount of smooth muscle running in all directions.

Small lymphocyte aggregations were present throughout the specimen.

Sweat glands and adipose tissue were completely absent. There was no sign whatever of any erectile tissue, but there was a rather large number of blood vessels in the lamina propria (see Fig. 7). These blood vessels were well formed and

appeared to be mainly thick-walled arterioles. There were no thin-walled capillaries or blood sinusoids typical of erectile tissue.

## Identification of Structure.

Morphologically the growth resembled a miniature replica of the vulva. There were inner and outer folds or lips which gave the appearance of labia minora and majora and an elongated central portion like a miniature clitoris. The whole specimen was bilaterally symmetrical.

From general arrangement of tissue it was concluded that the specimen had characteristics of a structure related to the urino-genital sinus and not those associated with perineal epidermis or skin. It resembled a much-folded labium minus. This view was confirmed by Professor Cameron, F.R.S., of University College Hospital.

Unfortunately it was impossible to obtain specimens of normal labium minus for the comparison but growth closely resembled those described by Bailey (Smith et al., 1943) and Maximow and Bloom (1942). According to these authors, normal labium minus consists of a richly vascular lamina propria of connective tissue with many elastic fibres and smooth muscle. Connective tissue papillae protrude into a superficial, stratified, squamous epithelium which is usually fairly heavily keratinized. There are many sebaceous glands but no hairs, fat or sweat glands.

Sections of normal specimens of vagina were also examined to see if that under investigation resembled vaginal structure in any way. Towards the mid-line of the structure under investigation the epithelium more closely resembled that of the vagina than that of the labia minora. In these regions there was complete absence of all types of glands. The proportion of muscle to connective tissue did not appear to be so

great as that in the sections of normal vagina which were studied.

#### Discussion.

From histological appearance it was quite clear that the structure under investigation did not in any way resemble a scar formation. Moreover it was clearly stated in the case history that at no time had the patient experienced any tear in the region of the perineum nor had any stitches been inserted.

At first it was thought that the structure might be some form of tumour, e.g., a haemangiomatous fibroma, but most of the evidence was against this diagnosis.

From Fig. 2 it can be seen that the specimen, unlike a haemangiomatous fibroma, is markedly bilaterally symmetrical. Moreover it is very unusual for a fibroma to exhibit such regular infoldings and outgrowths of tissue as are present in this structure. From consideration of its morphological form, therefore it is unlikely that this specimen is a fibroma.

Although some haemangiomatous fibromata do exhibit a fairly high degree of histological organization, this growth is much too well differentiated to be typical of any fibromatous structure. As already seen from figures 4, 5, 6, 7 the specimen has a well-formed superficial epithelium. The lamina propria contains a considerable amount of smooth muscle and many very well developed blood vessels. Such vascularity is of course apparent in a haemangiomatous fibroma, but the blood vessels are not usually so well developed in that type of structure and in this case they are considered to be typical, in number and form, of labium minus tissue.

The presence of sebaceous glands in the lateral parts of some regions of the specimen is also an indication that this is a more highly differentiated structure than a fibroma usually is.

Unfortunately the sections were cut too thick for a detailed investigation of nervous elements to be possible. However, several sections from the anterior, middle and posterior parts of the specimen were stained by Bodian's method for peripheral nerve fibres. In two oblique sections a few nerve fibres were visible at the edges, but it was impossible to determine the distribution of nerve fibres throughout the structure. As the patient complained of pain during coitus it is suggested that there was some hypersensitivity of the structure itself.

It is difficult to account for the actual development of this structure. As there was no sign of it before the birth of the child and it was so small as to be mistaken for a varicose vein at the time of delivery, it must have grown after parturition had taken place and when the concentrations of sexual hormones were decreasing. Although there would still be a fairly high concentration of anterior pituitary hormones, such as prolactin, in the patient's blood, the concentration of oestrogens would be considerably less than just before parturition.

It is interesting to speculate whether the growth would have continued to enlarge if it had been left in situ: also whether the epithelium would have undergone cyclic changes with menstruation, as described by Traut, Bloch and Kuder (1936) for normal vaginal mucosa, or merely have remained

No further information about the patient has been obtained. Unfortunately it was impossible to follow up the case and therefore it is not known if there was any abnormality in the healing of the wound after excision of the growth, or if the patient herself was born with any developmental abnormalities. It would be interesting to investigate the course of any subsequent Pregnancy.

An attempt was made to account for the morphological and histological form of this

specimen on known embryological princi-

It is known that duplicated structures may develop as a result of the action of field-gradient systems, e.g., limbs, tails, eyes, etc. Also there are many cases in which normal morphological differentiation of a structure may be accompanied by abnormal histological differentiation and vice versa. By a series of experiments with chick embryos, Strangeways and Fell (1926a, 1926b) showed that in the case of eye and limb rudiments, it is possible to get almost normal histological development accompanying abnormal morphological differentiation. It appears that something very similar may have taken place in the specimen under investigation. Histologically it resembles labium minus but morphologically it has the form of a replica of the whole vulva. Conversely Jenkinson (1915) showed that it is possible for morphological development to be almost normal although histological differentiation, e.g., in the case of the gut and central nervous system of amphibia.

It is difficult to account for the original stimulus for the production of this new growth. Balinsky (1925, 1926, 1927) and Filatow describe experiments whereby they produced accessory appendages in amphibia as a result of various stimuli, e.g., celloidin beads, ear vesicles, etc., grafted in various parts of the body. Guyénot (1928) produced similar accessory growths by the deflection of peripheral nerves. These authors make it clear that if any accessory growth results from stimulation of a developing morphogenetic field, that growth will have the form of the normal structures developed in that field, e.g., a limb will appear in a limb field and a tail in a tail field, and not a limb in a tail field or vice versa. Thus the quality of the structure produced is a specific property of the

field, the "activities" of which must be released by a variety of non-specific agents. The present miniature vulva developed in the vulva field must have done so in response to some form of stimulus, but it is impossible to ascertain what this can have been. However, it is clear that it is a characteristically vulval structure in a vulval field.

It is interesting to compare the present case with that of a bilaterally paired vulva described by Gemmell and Paterson (1913). The conditions of formation of the paired vulva were, of course, different from those of the present accessory vulva, but they lend support to the view that the vulva develops in a morphogenetic field and is susceptible to duplication.

#### Conclusion.

The morphological and histological structure of an accessory growth which developed on the undamaged posterior commissure of the labia majora after pregnancy, was investigated. Morphologically it resembled a miniature vulva, histologically it resembled labium minus. There was no previous history of any perineal abnormality.

It is suggested that the structure may have developed as the result of some abnormal stimulus in the urino-genital sinus field. It did not in any way resemble perineal skin.

We are indebted to Professor Cameron and Dr. Short of University College Hospi-

tal Pathology Department and to Professor Nixon, for help and information connected with this investigation, also to Mr. K. C. Richardson for details of his technique for mounting celloidin-paraffin wax embedded sections.

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Report of a Case of Uterus Didelphys Complicating Labour

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AND

JOSEPH C. PORTNUFF, M.C., M.D., Jewish General Hospital, Montreal, Canada.

FAILURE of the Müllerian ducts to fuse, with reduplication of the uterus, cervix and vagina, is uncommon, but a number of reports have appeared in the literature where this congenital anomaly has complicated pregnancy.

Uterus didelphys is most frequently discovered in pregnancy, and it is chiefly during pregnancy and labour that it becomes a formidable complication. During pregnancy abortion, premature labour, and premature separation of the placenta are more common. During labour uterine inertia, dystocia due to incarceration of the non-pregnant uterus, uterine rupture, and abnormal presentations are more frequent. Postpartum haemorrhage, retained placenta and subinvolution are added problems.

We are reporting the following case of uterus didelphys because of the unusual complication which developed during labour.

A woman, aged 35, 2-gravida, was admitted to the Jewish General Hospital on 16th September, 1946. Her menstrual history was normal, her periods occurred at regular 26-day intervals, and she did not complain of dysmenorrhoea. Her first pregnancy, in 1945, terminated in a spontaneous abortion at 10 weeks' gestation. She was now pregnant for the second time. The patient was known to have a double vagina, both compartments being of equal size. During her first prenatal examination, early in pregnancy, visualization of the cervices revealed two apparently normal nulli-

parous cervices lying side by side (Fig. 1). Two uterine bodies were palpable, equal in size, and, although the fundi appeared to be quite separate and distinct, the uteri could not be moved separately.

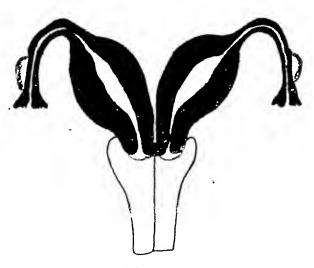


Fig. 1.

Uterus didelphys. Findings before pregnancy.

She was admitted at term, with membranes ruptured, but not in labour. Amniotic fluid was leaking from the vagina, the vertex was well engaged, the cervix, by rectal examination, was thick, and I to 2 cm. dilated. The non-pregnant cervix was high up and could not be palpated rectally. There were no uterine contractions noted.

Abdominally, the pregnancy was palpable in the right uterus, In the left lower quadrant of the abdomen the small globular left uterus, corresponding in size to a 6 weeks' pregnancy, was felt. It was noted that the non-pregnant uterus was

lying well out of the pelvis and, therefore, dystocia from an incarcerated uterus was not anticipated.

On 19th September, 48 hours after admission, labour became established, uterine contractions grew strong, the cervix became effaced, and dilated to 6 cm., the vertex descended to midpelvis; but in spite of active labour, no further dilatation occurred and no progress was made. The foetal heart became rapid, meconium-staining appeared for the first time, and a vaginal examination was then performed.

The presence of a complete vagina was confirmed. The right cervix was easily palpated through the dilated vagina. The fingers were then placed in the left vaginal compartment. Much to our surprise, the left cervix too was effaced, and about 4 cm. dilated. The vertex was palpated through this partially dilated left cervix, the examining finger was then passed into the left cervix, carried across the midline, and out through the right cervix without meeting any barrier (Fig. 2).

It was realized that a defect existed in the lower uterine segment of the adjoining uterine walls, and that the vertex was lying on a bridge of cervix formed by the two partially dilated cervices.

Labour had consequently reached an impasse,

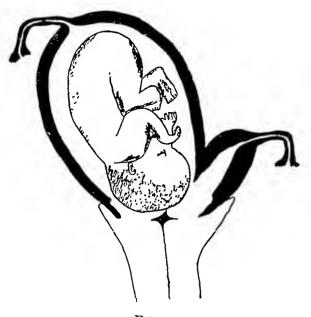


FIG. 2.

Findings during labour. Note rupture of intrauterine septum and head palpable through both cervices.

and operative interference was indicated. vaginal septum was divided between Kelly clamps and the cut edges sutured. The median bridge formed by the contiguous cervices was similarly cut and ligated. In this way a single cervical opening was created. This dilated readily. The head was found to be in deep transverse arrest with the occiput to the right. Forceps were applied in the transverse diameter of the mid-pelvic plane, the head rotated with the blades, and a living full-time female infant extracted as a right occipito-anterior through a mediolateral episiotomy. The infant was normal, but required resuscitation by intra-The secundines were retracheal intubation. moved manually. Both mother and infant left the labour room in good condition, and both were discharged from hospital on the 9th day after an uneventful recovery.

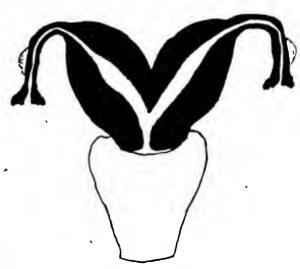


Fig. 3. Findings 6 weeks' postpartum.

Six weeks after discharge vaginal examination revealed a well-healed episiotomy. There was no rectocele or cystocele. A median raphe could be palpated both anteriorly and posteriorly in the now single vagina up to a single, rather broad cervix. Above this two uteri of equal size could be felt branching laterally from the mid-line (Fig. 3). They were freely movable but could not be moved independently of each other.

#### COMMENT.

When it was found early in labour that the non-pregnant uterus was lying above the brim of the pelvis, dystocia was not anticipated. As uterine inertia is a common concomitant of uterus didelphys, the rather prolonged labour, in itself, did not give rise to anxiety. However, when the vaginal examination was performed it became clear that operative interference was necessary to effect delivery.

It is interesting to speculate on the mechanism by which the head came to rest in a common lower uterine segment, lying on and dilating both cervices.

Schauffler (1941) described a case of complete reduplication of the uterus, cervix, and vagina, in which, by passing a uterine sound into each cervix, he was able to demonstrate a defect in the adjoining lower uterine segments. At a point about 1½ inches above the cervical os, the sounds met and clinked.

Where developmental anomalies of the uterus are found, muscular bundles are often thin, irregularly disposed and rather poorly vascularized. It is not surprising, therefore, that uterine inertia and uterine

rupture are frequently reported. It may well be that in the case reported above no defect of the intrauterine septum existed prior to onset of labour. Prolonged labour, with pressure of the head on an already poorly vascularized intrauterine septum may have resulted in pressure-necrosis and rupture of the septum.

Resection of the vaginal partition and division of the cervical bridge is not technically difficult, but careful haemostasis must be achieved because of the increased vascularity of the vagina at term.

Early recognition of the existing uterine and vaginal anomalies will result in better treatment of these complications of pregnancy.

#### SUMMARY.

- I. A case of uterus didelphys is reported, in which an unusual complication developed during labour.
- 2. The possible aetiology of the dystocia is discussed.

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# A Benign Tumour of the Placenta

BY

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Tumours of the placenta are sufficiently rare to warrant the description of yet another. Their incidence has been variously estimated as occurring once in every 9,000 deliveries (Kuehnel, 1933) to once in 3,500 (Marchetti, 1939). It would appear that minute and careful study of all placentae delivered would reveal that the frequency is even higher as undoubtedly small and deeply situated tumours often pass undetected.

## Clinical history.

Placenta.

The patient was aged 30 years. Her first pregnancy and delivery had been normal. The antenatal course of the second pregnancy was normal. Labour lasted 10 hours, the membranes ruptured spontaneously and the delivery of the child was spontaneous. The volume of amniotic fluid was not considered abnormal. The child was a healthy male weighing 8 pounds, 3 ounces. The placenta was delivered 20 minutes after the birth of the child. The blood loss was not excessive; the puerperium was uneventful.

The placenta was fixed whole in Kaiserling No. 1 fluid. When fixed it weighed 27 ounces (765 g.) and measured 8 by 61/2 by 11/4 inches (20 by i6.5 The umbilical cord was normal in by 3 cm.). appearance and attachment. At the margin of the placenta and attached to it by a short but broad stalk was a solid red mass measuring 13/4 by 11/2 by 34 inches. This in turn was connected on the side away from the placenta by a thick stalk to a second and larger mass of similar appearance, measuring 2½ by 2½ by 1 inches (Fig. 1). Attached to the outer (uterine) surface of the chorion laeve a short distance from the above tumours and independent of them was a pale grey-stalked tag measuring 3/4 by 1/2 by 1/2 inch. This showed no obvious stalk connecting it with the placenta or

with the other masses and must have projected in utero into the cavity of the organ, covered by the decidua capsularis in earlier stages but becoming exposed in the cavity as this degenerated in later pregnancy. 'Traced from the placental margin the chorion laeve and amnion clothed the foetal surface of the medium-sized mass and its stalk but did not extend on to the surface of the largest mass, so that the former projected into the amniotic cavity on the one hand and into the uterine lumen on the other, whilst the latter projected from it to lie free in the uterine lumen. All three masses thus lay at first between chorion laeve and the decidua capsularis but later, with the degeneration of the latter, projected into the uterine lumen directly, whilst the medium-sized mass also projected to some extent inwards into the amniotic cavity.

Two large blood vessels, an artery and a vein, passed directly from the umbilical cord over the foetal surface of the placenta, apparently without supplying it, through the stalk to the medium-sized tumour, supplied it and then passed along its margin and through the second stalk to end by supplying the largest tumour (Fig. 1). The smallest tagged mass was supplied independently by two minute vessels from the adjacent part of the placenta, these being the terminal branches of one of the placental vessels.

On section, each mass consisted of solid red tissue not unlike liver in appearance and consistency. Microscopically all the masses showed a similar structure. They were clothed externally by a thin, relatively acellular capsule or pseudocapsule of connective tissue on the surface of which could be seen, in places, remnants of the trophoblast (Fig. 2). This pseudocapsule was arranged in irregular lamellae, its cells and fibres being mainly orientated parallel to the surface whilst running in it were the large blood-vessels of the tumour. Deeply this pseudocapsule merged, with varying degrees of indistinctness, with the main



Placenta showing the larger masses of the tumour. The smaller mass has been removed but its situation can be seen to the right vessels to these masses can be seen coursing over the placenta.

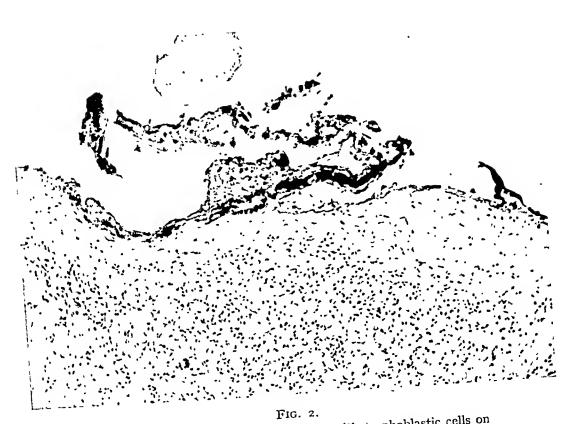
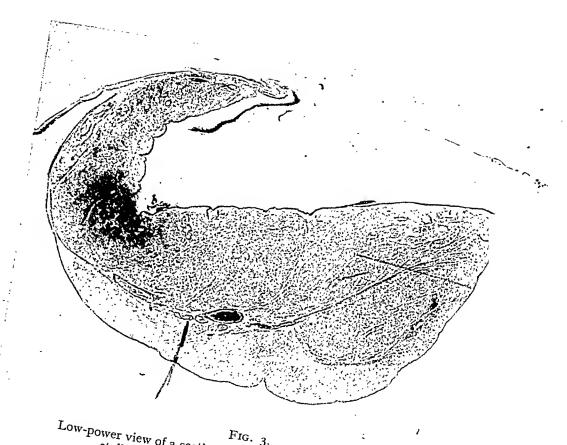


Fig. 2. Pseudocapsule of one of the tumours with trophoblastic cells on its surface.  $\times$  112.

D.V.D.



Low-power view of a section of the smallest tumour with its broad stalk and attachment to the chorion laeve. ×8.

D.V.D.

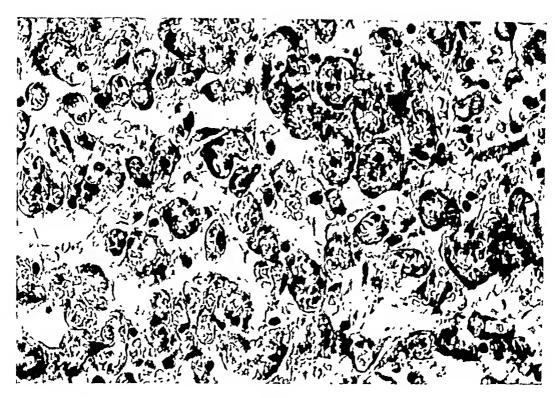


Fig. 4. High-power view of a capillary area.  $\times$  500.

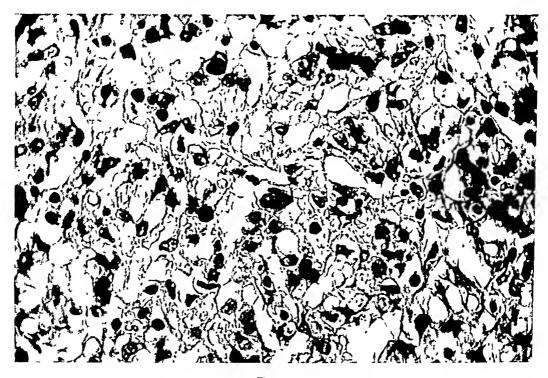


Fig. 5 High-power view of a cellular, endotheliomatous area  $\,$  Note the intra- and extracellular spaces  $\,\times\,500$ 

substance of the tumour. These trophoblastic remnants were clearly traced over the various stalks to become continuous with that on the chorion laeve. In most places, however, the surfaces of the tumours were devoid of trophoblastic cells, these occurring in the main as isolated islands except at the stalks of attachment to the chorion where a more or less continuous layer was seen. These scattered trophoblastic remants, however, made it quite clear that all the masses originated from inside the trophoblast of the chorionic vesicle or from it, the original trophoblastic coat having become attenuated and disrupted, possibly by the growth and outward expansion of the tumours. In and around the trophoblastic cells lying at the surface of the tumours was a considerable deposit of fibrin or fibrinoid material similar to that seen in the subchorial region and in Langhan's fibrin stria. The chorionic mesoderm quite clearly provided the pseudocapsule of these tumours, appearing to split to enclose them at the stalks of attachment.

Passing inwards from the pseudocapsule were a varying number of irregular septa carrying the blood supply to the tumour substance (Fig. 3). These septa branched as did the blood-vessels, became attenuated and eventually merged with the tumour substance. They tended to divide it into irregular and incompletely separated lobules. These septa together with the walls of the bloodvessels showed a considerable degree of hyaline degeneration. Between the septa and in continuity with them the tumours showed a variable structure. In places they consisted of closely packed masses of capillaries with distinct endothelial walls (Fig. 4) whilst in other regions they were more solid and cellular in nature (Fig. 5). These two types of tissue were in most places distinct and lobular but in parts they were intimately intermingled and in some lobules lay adjacent to one another with a transitional zone intervening. In the more cellular areas the cells were of various types. A few were typically mesodermal, comparable in their morphology and staining reactions with those seen in the villi of the normal full-time placenta. The most numerous cells were much larger, up to 20 or  $30\mu$  in their greatest diameter. They had a finely granular, eosinophilic cytoplasm, large nuclei staining heavily with haematoxylin, the chromatin being to some extent concentrated immediately under the nuclear membrane. Most of the cells had distinct cell walls but elsewhere multinuclear strands in which no cell walls were present occurred; a few large syncytial multinuclear masses were found. vacuoles were present in the cells and within the syncytial masses whilst large numbers of intercellular spaces devoid of blood cells were seen. Thus vacuoles, both intra- and intercellular, were a characteristic feature of this tissue (Fig. 5). Some of these cells seemed to participate with typical endothelial cells in forming the walls of capillaries and in other places the cells and syncytial masses formed the walls of irregular spaces containing redblood cells. Indeed in this tumour were found intercellular spaces containing red cells, capillaries with an incompletely differentiated endothelium and capillaries with well-formed and typical endothelial walls.

The cellular areas of the tumour predominated over the capillary areas, the tumour was more solid in character than naevoid, but in the former areas many of the nuclei were pyknotic in character, whilst in other places and in the syncytial masses fragmentation of nuclei had occurred.

#### DISCUSSION.

The tumour is clearly a haemangioblastoma with an admixture of capillary vessels and endotheliomatous masses, in fact a capillary haemangioendothelioma with the endotheliomatous tissue predominating. Its origin is undoubtedly in the chorion, either from its trophoblastic or mesodermal cells and may be accurately described as a chorioangioma.

No attempt will be made to discuss benign tumours of the placenta in respect to their frequency, distribution and various designations which they have received in the past. All this is dealt with admirably by Marchetti (1939) in a recent review with the description of 6 cases. He is of the opinion that most of the benign tumours of the placenta, if not all, are chorioangiomata, but that overgrowth of the endotheliomatous elements has frequently led

observers to designate them incorrectly as fibromata, fibrosarcomata, sarcomata, etc.; whilst added myxomatous degeneration has led to some being designated myxosarcomata. Marchetti considers them as due to growth and proliferation of a group of blood-vessels and stroma outside their regular arrangement, and with restriction of the normally developing chorionic villi.

The author has been impressed by the similarity of the cells and syncytial masses in the more cellular areas of the tumour to the parent tissue of all endothelium, the angioblastic tissue. Furthermore. views present-day that angiogenesis, whether it derives directly from the trophoblast or from the chorionic mesoderm, is an important normal and early function of the chorion, makes it likely that this tissue should, from time to time, be the source of haemangioblastomata; in this connexion the studies of various embryologists of this angiogenesis in the human chorion is of interest. In particular Hertig (1935) describes angioblastic masses and mesodermal cells as arising from the trophoblastic cell columns which form the primitive villi and from the associated chorionic trophoblast. The period of their formation from trophoblast is limited to that of the differentiation of the primary villi and the process is not seen in connexion with the secondary villi. Whether one considers trophoblast as the parent tissue or the chorionic mesoderm, it is clear that the term chorioangioma remains applicable, but perhaps not so precise as it could be. The angioblastic strands once formed proliferate, grow independently, and invade newly formed secondary villi and their branches, so that in its growth the angioblastic tissue originates in continuity all over the chorion and villi. This stage of continuity, how-. ever, is subsequently lost by attenuation of the connecting strands, leading to a

vascular discontinuity later, particularly for the larger villi. The body stalk probably derives its angioblastic strands similarly in continuity with those from the chorion. This latter feature has been observed by Hertig in macaque embryos. By this process of growth of the angioblastic tissue it is clear that this tumour may originate in some of the angioblastic strands, whether in the secondary villi, chorionic plate or umbilical cord, becoming completely or almost completely detached from the remainder whilst continuing their proliferation locally to form a tumour, or even failing to re-establish their continuity with the rest of the vascular network subsequently. The degree of their differentiation and the extent of their connexion with the umbilical vessels will determine the exact nature of the tumour. from the original angioblastic tissue will adequately explain the position of these tumours and their relative frequency in the placental tissues. It places their time of origin at an early stage in development, during the extension of the angioblastic strands vascularizing the secondary villi and their branches.

### SUMMARŸ.

- 1. A haemangioblastoma of the placenta is described.
- 2. The view is advanced that these arise early, from angioblastic strands which take on unrestricted growth and may or may not completely lose their continuity with the primitive angioblastic network, or, having lost this continuity, may fail in part or wholly to re-establish it.

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Kuehnel, P. (1933): Acta Obstet. gynec. scand., 13, 143.

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## An Unusual Case of Infection of a Sixteen Weeks' Extra-uterine Pregnancy

BY

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THE following case came to my notice while I was acting as radiologist to a small hospital in India. The radiological findings are unusual and interesting.

The patient was a white woman, aged 37 years, who was admitted to hospital on 13th July, 1945, complaining of severe abdominal pain and vaginal bleeding following an attempt to end an unwanted pregnancy. Her last period had begun on 9th May, and lasted for some weeks. When nothing occurred at the expected time of the July period she concluded that she was pregnant, and sought assistance to procure abortion.

On admission to hospital 5 days later, a piece of wood 2 inches long was removed from the cervical canal. The uterus was of normal size and a mass "two fists in size" was felt through the right fornix. It was concluded that the patient was not pregnant, and that the mass in question was a fibroid. Her pain subsided, and no further local or general symptoms developed. She was discharged on 4th August.

On 19th August the woman was readmitted to hospital with symptoms attributed to internal bleeding and peritonitis. She confessed that she had undergone 2 further illegal operations, 7 and 4 days previously. She had severe abdominal pain, slight vaginal bleeding, and was vomiting. She was shocked, and the abdomen was distended. The pulse-rate

was 142, the blood-pressure 100/80, and the temperature subnormal. The uterus was thought to be enlarged to the size of a 4-months' pregnancy, and the appendages were tender and seemed to form part of a hard mass reaching to the pelvic wall on both sides. The cervix just admitted the tip of a finger. Half an hour after admission, the pulse-rate had fallen to 100 and the blood-pressure had risen to 125/90, and, as the woman was so much better, operation was not deemed necessary. During the next 5 days, she was given 1,000,000 units of penicillin intramuscularly. Her general condition continued to improve, but she developed an evil-smelling vaginal discharge. On 26th August she passed some clots of blood from the vagina and some tissue, which was thought at the time to be products of conception, and subsequently verified as such by microscopy. Further small haemorrhages occurred in the ensuing fortnight.

On 24th August she was discharged at her own request. The uterus at this time is said to have been the size of a 4 to 5 months' pregnancy, and the diagnosis was an infected tumour of the uterus, probably fibroid. Hysterectomy was to be considered when the infection had subsided.

She continued to have a foul-smelling vaginal discharge and ran a fever which varied between 99° and 100°F.; she had no further haemorrhage. On 11th October she was sent to see a consultant surgeon,

who gave as his opinion that "but for the microscopy report I should consider this a case of fibroids complicated by peritonitis secondary to interference in an incorrectly diagnosed pregnancy."

On his recommendation the patient was re-admitted for a further course of penicillin on 13th October. Examination at that time suggested that the uterus had further increased in size and that it approximated a 5 to 6 months' gestation. On 19th October she was sent for an X-ray examination, and it was then that I saw her for the first time. Radiography revealed a foetus of 4 to 5 months' maturity (Fig. 1); there were no definite signs of foetal death. Clinically, the patient appeared toxic and wasted. There was a hard nodular tumour arising from the pelvis, mostly situated towards the right side of the abdomen. It was slightly tender and fixed to the deeper Quinine and pituitrin were structures. given in repeated doses for several days in an effort to cause the uterus to expel the foetus, but without success. The temperature remained raised, and there continued to be a foul brown vaginal discharge. The upper surface of the mass became softer, but the lower part remained hard, and became very tender. The white-blood count was 10,000 with 87 per cent polymorphs and 10 per cent lymphocytes.

By 2nd November, the patient's temperature was higher and had begun to swing, reaching between 103° and 104°F. in the 24 hours. It was decided to make a further X-ray examination. This showed a most unusual picture (Fig. 2). The foetus was completely surrounded by gas, and there appeared to be gas in the foetal skull and possibly also in the abdomen; the findings indicated death and infection of the foetus with gas forming organisms.

Since it was thought that the foetus was lying *in utero*, an attempt was made to evacuate it through the vagina. The cervix

was dilated, but the uterine cavity was found to be empty, and a perforation was discovered in the anterior wall of the cervical canal. Laparotomy was then performed, and the mass in the pelvis found to be a large abscess, sealed off by adhesions, containing the foetus and a large quantity of offensive pus with a faecal odour. The foetus was removed, and the abscess cavity drained. Unfortunately a culture was not made from the pus, and the specimen was thrown away before I had time to examine The patient's general condition then quickly improved. Two days after operation she developed a faecal fistula but this closed spontaneously. The latest report was that she had put on weight and made a full recovery.

#### DISCUSSION.

On reviewing this case, it seems clear that the patient had an ectopic gestation which ruptured on 10th August, the resulting haemorrhage ceasing spontaneously. The foetus may have continued to live as an abdominal pregnancy, thus accounting for the increase in the size of the mass, and the maturity of the foetus as measured from the first radiograph, but the evidence for this is not certain. The foetus died when it was between 16 and 20 weeks old. The patient had also a low-grade pelvic peritonitis resulting from the perforation of the cervical canal. The tissue which she passed vaginally on 25th August must have been the decidual cast. Infection converted the amniotic sac into an abscess cavity, gave rise to the swinging temperature, and was revealed by the second radiograph. There was evidently some connexion with the bowel, since at operation there was a faecal odour and after operation a faecál fistula developed; the radiographic appearance of gas would also be explained thus.

Numerous cases of infected ectopic pregnancies are on record. Falk and

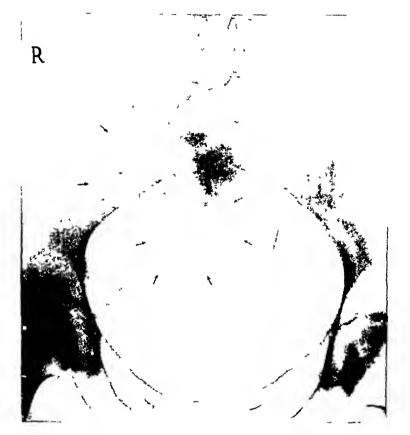


Fig. 1.

19th October, 1945. A foetus of 4 to 5 months' maturity can be seen overlying the right sacroiliac joint.

J.L.B.



FIG. 2.

and November, 1945. The foetus is now outlined by gas, and there appears to be gas in the foetal abdomen and skull.

J.L.B.

Blinik (1940) in their review gave a full bibliography of the cases published up to that time. They maintained that the most important sources of infection of an ectopic pregnancy was intra-uterine manipulation, usually, of course, curettage. They also stated that they often found evidence of attempted abortion in cases of ectopic pregnancy. They did not make any reference to radiographic evidence of gas formation in any case. Lubin and Waltman (1943) have since described a case of sepsis in an abdominal pregnancy past term, but no radiographs are shown.

I have been unable to find any other case with similar radiographic findings in the literature.

#### SUMMARY.

A case of abdominal pregnancy is described with subsequent infection and gas formation in the resultant abscess and in the foetal skull.

I wish to express my thanks to Dr. F. H. Kemp for his encouragement and help in the presentation of this case.

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## Acute Rheumatism in Pregnancy

RV

# FLORENCE McKeown, M.D., Institute of Pathology, Queen's University, Belfast.

THE main purpose of this paper is to report 2 cases of pregnancy complicated by acute rheumatic heart disease. These cases are interesting in that there was no clinical evidence of the condition while the heart showed severe myocardial damage. Both patients died following delivery; in one of them the symptoms simulated acute obstetric shock. Several other cases of rheumatic heart disease in pregnancy have been reviewed and included in this report, with the purpose of determining the frequency of rheumatic recrudescences during pregnancy and the part they play, if any, in dictating the development of acute cardiac failure or the onset of decompensation in a heart with long-standing valvular disease.

#### CASE I.

The patient, aged 30, was pregnant for the first time. There was no previous relevant history, and she was in good health till the onset of labour. One hour before delivery she had a rigor, and was given a pint of glucose saline intravenously. The duration of labour was 22 hours, and terminated in a forceps delivery. Following delivery the blood pressure fell to 80/40, and the pulse-rate increased to 140. She was given a pint of plasma, and the blood-pressure rose to 105/80. Two hours later she developed acute pulmonary oedema and died.

#### Relevant Postmortem Findings.

The heart weighed 10 ounces (283 g.). The epicardial surface was smooth, the right auricle slightly dilated, and the tricuspid valve normal. The right ventricular musculature felt flabby, and the cavity was dilated. The endocardium of the left auricle was slightly thickened and wrinkled in the region of MacCallum's patch. The mitral valve

admitted 2 fingers. The cusps were thin, but showed the presence of several small verrucose vegetations along the line of closure. The left ventricular cavity was dilated, and the muscle felt somewhat soft.

The lungs showed acute pulmonary oedema.

#### Histological Findings.

Heart. The mitral valve showed slight fibrosis and infiltration by cells of the large mononuclear series. Vegetations, composed of deeply staining eosinophilic necrotic collagen, projected from the auricular surface of the cusp. In the adjacent valve spindle-shaped cells covered by a thin film of fibrin formed a palisade to the surface. In the myocardium there was paravascular scarring and in addition Aschoff nodules in all stages of development, indicating repeated recent episodes of rheumatic carditis. The coronary vessels were also involved and showed medial fibrosis and recent acute fibrinoid necrosis of their walls.

#### Anatomical Diagnosis.

- 1. Prolonged labour, maternal distress, forceps delivery.
  - 2. Recurrent rheumatic carditis and valvulitis.
- 3. Acute left ventricular failure following delivery.
  - 4. Acute pulmonary oedema.

#### CASE 2.

The patient was aged 23. It was her first pregnancy. She had a previous history of scarlet fever and rheumatic fever, but her health during the present pregnancy was excellent. The onset of labour was normal. Labour lasted for 28 hours. She was given 1 pint of glucose saline intravenously before delivery because of dehydration. Delivery was by forceps, and there was no excessive blood loss, nor evidence of shock. Nine hours after de-

livery, however, the patient complained of pain in the abdomen, became pulseless and died within a few minutes.

Postmortem Findings.

The heart weighed 14 ounces (340 g.) The right side of the heart was normal. The left auricle was dilated, and lined by smooth endocardium. The mitral valve admitted 2 fingers, the cusps were unthickened, but along the line of closure there were small verrucose vegetations. The left ventricle was dilated, the muscle showing no macroscopic lesion.

The lungs showed terminal congestion and oedema.

Histological Findings.

Heart. The mitral valve showed the presence of numerous vessels in the auxicular layer. A vegetation with hyaline cap of collagen and Aschoff cells in its base projected from the valve surface.

In the myocardium there were numerous Aschoff nodules, all showing polarization and signs of healing. There was slight involvement of the coronary vessels and well-developed paravascular scarring.

Anatomical Diagnosis.

- 1. Recent delivery.
- 2. Recurrent rheumatic carditis and valvulitis.
- 3. Acute myocardial failure.

Six cases of mitral stenosis in pregnancy in which the patients died from cardiac failure were examined for evidence of recent rheumatic carditis. In 4 of these rheumatic vegetations were present on mitral or aortic valves, and histologically there were Aschoff nodules of recent development, i.e., I to 4 months in the myocardium. The degree of myocarditis together with the valvular lesions was such as to suggest that the recrudescence of rheumatic infection was the important factor in leading to cardiac decompensation.

One other patient died from subacute bacterial endocarditis and here again the myocardium was the site of active rheumatic lesions. In only I patient with mitral stenosis and decompensation during pregnancy was there complete absence of any evidence of recent rheumatic carditis.

Most of the literature on Comment. rheumatic heart disease and pregnancy deals with the factors which determine the onset of decompensation and the prognosis is believed to depend largely on the severity of the valvular lesions. The important part played by a recrudescence of rheumatic carditis is often overlooked. The 2 cases considered in detail here illustrate that recurrent rheumatic carditis, even in a heart not the site of a mechanical lesion, may be responsible for acute myocardial failure particularly following delivery. second group of cases shows that in mitral stenosis recurrent rheumatic carditis may often be the deciding factor which dictates the onset of decompensation, and the pregnancy itself may have little influence on the course of events. Admittedly this conclusion is arrived at after a study of only a few The high incidence of active rheumatic lesions discovered in this small series suggests, however, that in the absence of microscopical examination of the heart it is dangerous to correlate the presence of a chronic valvular lesion with the fatal outcome. In the past the omission of microscopical examination has led to an overemphasis of the mechanical defect produced by the valvular lesion.

Sheehan and Sutherland (1940) in their report on heart disease and pregnancy found that nearly all of the obstetric patients whose hearts had been decompensated, or who had died from cardiac failure had recurrent endocarditis. They find difficulty in explaining the association and feel that it is not clear whether the recurrent endocarditis causes or is caused by decompensation or whether both are the result of a third factor. However, it is probable that they were dealing with a

recrudescence of rheumatic fever similar to that in this series. Furthermore, in the past if a patient with a known valvular lesion showed signs of cardiac failure during pregnancy the cardiac defeat was attributed to what was termed the "progressive nature of the valvular lesion." It was only when clinical signs of a rheumatic recrudescence were present that other factors such as a reactivation of myocardial damage were considered of importance. It is therefore essential that it should be realized that the absence of clinical signs does not exclude the presence of acute rheumatism even in a severe form.

In these 8 cases of rheumatic heart disease complicating pregnancy, 6 had recurrent myocarditis, death resulting from decompensation or acute cardiac failure. Aschoff nodules of all ages were present in These in themselves the myocardium. contribute little towards the ultimate cardiac failure. In rheumatic carditis however, it has been shown that the coronary arteries seldom escape (McKeown, 1945) and the necrosis of vascular walls which occurs with the subsequent interference with myocardial nutrition must inevitably lead to impairment of cardiac function. If the patient has entered upon pregnancy with a compensated valvular lesion it is obvious that interference with myocardial nutrition by the acute rheumatic lesion of the coronary arteries may easily disturb its power of compensation. This is particularly so when the pregnancy itself and an exhausting labour have already tested this compensation. Whilst therefore in some patients the pregnancy and strain of labour may be of themselves sufficient to lead to cardiac decompensation the present study suggests that a recrudescence of rheumatic

fever with its weakening of the myocardium plays an important and not infrequent part in producing such decompensation.

It is impossible to conclude from this small series of cases whether pregnancy predisposes in any way to a flare-up of rheumatic heart disease. Before this can be accurately estimated, one would stress the need for complete postmortem examination in all fatal cases of heart disease in pregnancy. Such an examination should include a histological study of many blocks of the heart.

Finally, since the clinical picture in one of these cases simulated obstetric shock it is important that in all cases of obstetric shock, in which there does not appear to be adequate cause for its development, the presence of an active rheumatic carditis should be excluded whether or not the patients are known to have cardiac disease.

#### CONCLUSIONS.

- r. Rheumatic heart disease, even in its severest form, may occur subclinically.
- 2. Recrudescences of rheumatic fever during pregnancy in a patient with a known cardiac lesion may not infrequently be the factor responsible for cardiac defeat.
- 3. The patient with active rheumatic carditis may die quite suddenly following delivery, the condition simulating acute obstetric shock.

My thanks are due to Professor C. H. G. Macafee for allowing access to the clinical notes of these cases.

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Fig. 1. Section of Fallopian tube showing secondary nodule of growth. February 1945.  $\times$  90. J.w.

## Testosterone Propionate in Inoperable Carcinoma

BY

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In this Journal (Wyatt, 1945) I reported on 2 cases of inoperable carcinoma of the ovary treated with large doses of testosterone propionate with no seeming success.

In conclusion I stated that I felt that some good might arise from such treatment, if the end organ, viz., the uterus, was affected.

In February, 1945, a married woman of 57 was admitted under me in St. Thomas's Hospital with post-menopausal bleeding.

Her past history revealed no major disease; she had had 4 children and 2 abortions and menstruation, which had been normal, had ceased some 6 years previously.

For  $5\frac{1}{2}$  months she had noticed a watery discharge from the vagina, this later becoming bloodstained. It was intermittent at first; but for the last 3 months had been continuous and had been pure blood. There had been marked frequency of micturition, accompanied by a bearing-down pain, and for 2 months pain in both groins. She had lost about 1 stone (1.8 kg.) in weight.

On examination the vault of the vagina was conical and the uterus was felt to be enlarged with some fixity, and thickening in the right broad ligament. A diagnostic curettage was carried out and the curettings showed a squamous-celled carcinoma.

A fortnight later the abdomen was opened, the growth was found to have invaded the uterine wall and extended in

the right broad ligament to the pelvic wall; large secondary glands were visible along the right iliac vessels and at the aortic bifurcation; a nodule from the right Fallopian tube was removed for biopsy (Fig. 1) and the abdomen closed.

A consulation with the Radiotherapist took place about treatment with deep X-rays, but he was of the opinion that it would be of no value; so it was decided to try the effect of large doses of testosterone propionate.

Commencing on 5th March the patient was given 525 mg. the first week, 825 mg. the second week and 1,050 mg. the third week. The dose was then gradually reduced and by the end of May she had received 6,525 mg.

From then onwards she was given 2 injections a week of 75 mg. each, attending as an outpatient from April 16th. By the 24th of April all vaginal bleeding had ceased, she felt much better and had practically no pain; her voice sounded a little husky, but there was no appreciable growth of hair on the face.

From the beginning of June there was an occasional slight loss of blood for about an hour at a time. On examination in September the uterus seemed to be slightly smaller and more mobile, so it was decided to do a further curettage to ascertain if any marked change had taken place; this was carried out on roth October, but the curettings still showed active carcinoma.

Following this the loss of blood per

vaginam came on daily, so the dose of testosterone was doubled, 150 mg. bi-weekly being given.

In January, 1946, the patient reported that there was a slight loss once a fortnight, but that her general condition was good. In March the loss was reported to be once a week, so the dosage was further increased to 400 mg. a week.

The woman was putting on weight; but her pelvic state was unchanged and she now noticed some growth of hair on the upper lip and chin, not obviously noticeable unless examined closely, and her voice, if anything became more normal. She had occasional attacks of abdominal pain, which were quickly relieved by a couple of Veganin\* tablets.

In January 1947 she complained of some leakage of fluid per vaginam and on examination some watery secretion was seen escaping through the stenosed vaginal vault in small quantity; but a catheter specimen of urine did not show cells suggestive of a fistulous opening.

The uterus was now definitely larger and fixed and the patient was obviously going down hill. Testosterone was continued until 19th March, by which time she had had in all 35,000 mg. It was now felt to

be doing no further good, and so it was stopped.

The patient was admitted to hospital, where she remained for 7 weeks, and was then transferred to a Home for the Dying, where she lingered on until 14th June. Most unfortunately a postmortem examination was refused by her relatives.

I have no doubt that the treatment prolonged this woman's life for a considerable time and in comparative comfort. How it acted is difficult to say; if by inhibition of pituitary action, then one might expect to obtain the same result with large doses of stilboestrol with, however, a probable increase, rather than a decrease, in the uterine bleeding.

If and when a preparation becomes available at a reasonable price, further trials might be made in suitable cases; but at present the high cost of testosterone prevents any extensive investigation.

The material used in the early treatment of this case was the remainder of that used for the treatment of cases of ovarian carcinoma, provided partly by a grant from the Medical Research Council, partly from Boots's Pure Drug Company, and later by St. Thomas's Hospital.

The histological sections were reported upon by Dr. J. Bamforth and the microphotographs prepared by Mr. A. E. Clark.

To both my thanks are due.

<sup>\*</sup> Asprin, gr. 4; phenacetin, gr. 4; codeine phosphate, gr. 1/2.

## Intracranial Haemorrhage in the Newborn\*

BY

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THAT intracranial haemorrhage is a frequent and often a fatal complication of childbirth is generally recognized, but little, if any, advance has been made in the prophylaxis of this condition since Holland and Lane-Clayton (1926) first drew attention to it in their admirable report more than 20 years ago. Figures showing the incidence of intracranial injuries from various sources show some variation, but, generally speaking, it may account for approximately 25 per cent of deaths among infants born at term and a considerably higher number, roughly 30-40 per cent, of deaths among premature infants. Toverüd (1036) found evidence of intracranial haemorrhage in 39 per cent of stillbirths in an analysis of 953 cases. Macgregor (1943) showed intracranial haemorrhage as the cause of death in 39 per cent of autopsies on 338 infants during 1939-1941. Dublin, Geoghagan (1947), pathologist to the National Maternity Hospital, found intracranial haemorrhage in 21 per cent of infants coming to autopsy out of 232 cases. If we include the major portion of cases of asphyxia pallida and the infants that recover or die without coming to postmortem examination, the incidence of this condition must be indeed high.

That Vitamin K is not the prophylactic agent we had hoped it might be, is shown by Lehmann (1944) who, in a comparison

of deaths from bleeding in 13,250 infants receiving Vitamin K with 17,740 untreated cases, showed that only 1.6 per 1,000 might be saved by Vitamin K administration.

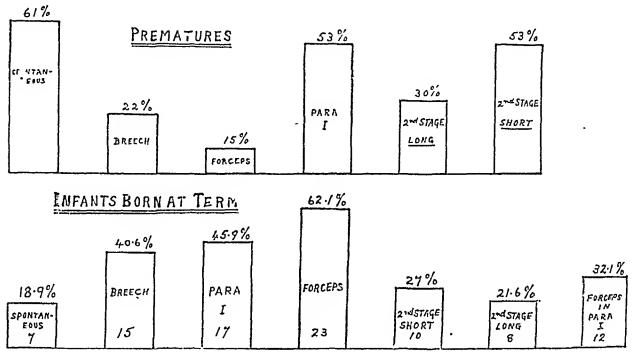
Furthermore, most of the deaths in his series occurred in the first 24 hours, indicating that the traumatic factor predominated as a cause of death. From the paediatric angle there is little we can do for these cases; the principal hope in treatment lies in prophylaxis. As a paediatrician, however, I am not qualified to discuss obstetrical problems. Yet if I may bring the infant a little more prominently to your minds, in contrast to the maternal picture which is more apt to occupy the major place in obstetrics, I may, perhaps, provoke discussion among those who are fully competent to deal with the subject from the obstetric point of view, in the hope that some procedures may be evolved to help to reduce this major cause of neonatal death.

From the infant's point of view, the main cause of intracranial injury is trauma, with possibly asphyxia operating as a second factor. The amount of trauma necessary to produce injury seems to vary with the individual case, the biggest discrepancy occurring between mature and premature infants—the premature baby being particularly liable to bleeding, owing to his much more friable vessels and his softer and more pliable cranial bones. The great majority of the haemorrhages are subdural in type—the odd extradural ones probably only occurring in conjunction with frac-

<sup>\*</sup> Read at the International Congress to celebrate the bi-centenary of the Rotunda Hospital, Dublin, on 11th July, 1947.

ture of the skull and, owing to the adherent character of the dura, are relatively unimportant.

By far the commonest lesion, in 50 cases here reported, was a tentorial tear producing bleeding either above or below the tentorium. ing is difficult to say. The available evidence would suggest that asphyxia is in itself a causal factor. Ehrenfest (1939) found intracranial haemorrhage in approximately 80 per cent of all asphyxiated babies coming to postmortem examination. On the other hand, it may be argued that asphyxia is



Graphs showing associated factors in 50 cases of intracranial haemorrhage in premature and mature infants. It will be noticed that spontaneous delivery, para. 1, and short second stage predominate among the premature group, which contrasts considerably with the factors shown in the mature group.

Rupture of the great vein of Galen may occur, allowing the blood to drain down around the pons, medulla and cerebellum. The cerebral veins are sometimes liable to tear, owing to their firm attachment to the sinuses, from the more freely mobile brain. Rupture of the sinuses themselves is fortunately rare, only occurring in conjunction with extremely severe trauma. Similarly rupture of the internal cerebral veins is also very unusual.

As to what part asphyxia plays in the cause, if it is a cause, of intracranial bleed-

the result of the haemorrhage. Whatever the mechanism, the evidence is overwhelmingly in favour of anoxaemia being a causative factor. If this is so, and it has yet to be proved that it is not, cannot asphyxia be prevented to a certain extent in some cases, by the avoidance of excessive anaesthesia and analgesia, by trying to avoid a prolonged second stage, and the use of drugs that may produce tonic uterine contractions or affect the foetus directly?

The type of case where the anoxaemia is due to, say, a subplacental haematoma or

mechanical pressure on the cord is of course in a different category. Whatever the cause, the fact remains that if we can reduce our incidence of asphyxia, we shall also reduce our cases of intracranial bleeding from this source. The traumatic factor is much more involved. The types of labour more commonly associated with intracranial damage appear to be precipitate labour, prolonged second stage, breech presentation, internal version and extraction, and difficult forceps. The well-applied low forceps, on the other hand, is often instrumental in preventing the sudden expansion of a well-moulded head, with consequent tearing of an intracranial vessel.

As regards the lesions in our series of cases, tears of the tentorium constituted as much as 96 per cent of the total. This figure may seem high in comparison to that of other observers. On the other hand, McGuinness (1943) found tentorial tears in 92.5 per cent of deaths from intracranial haemorrhage in an analysis of 52 cases in 1943. The site at which the damage most commonly occurs is in the triangular area, at the junction of the falx and tentorium. Tears in the tentorium may be produced in various ways:—

- I. By anteroposterior pressure on the skull, producing an elongation of the calvarium, which causes stretching of the falx and tentorium in direct proportion to the pressure applied.
- 2. By lateral pressure on the head producing the same effect.
  - 3. By direct traction on the scalp.
- 4. By traction on the body as in breech birth, thus drawing the medulla down and favouring tentorial rupture. At the same time, compression of the trunk during breech delivery tends to cause intense intracranial venous congestion, which in turn aggravates any haemorrhage present. These are some of the factors which account

for the severe intracranial haemorrhage associated with breech birth, apart from the rapid moulding in these cases. The accompanying photographs are an attempt to show the effect of the tentorium of traction on the skull.

Fig. 1 shows the effect of slight anteroposterior pressure.

Fig. 2 shows the considerable tension on the falx and tentorium with a direct pull on the scalp of I pound.

Fig. 3 shows the result of a 2-pound pull. The tentorium is stretched like a bowstring, and ready to rupture on the least sudden movement. The same effect may be produced by lateral or longitudinal pressure. Fig. 4, 2-pounds traction has been applied to the occiput and the chin. It can be seen that with this occipito-mental traction, no strain whatever is put on the falx and tentorium, and it appears to be the only angle in which strong traction may be applied without risk of tentorial rupture.

Though I fully realize that it may be impossible to produce traction in this angle and yet maintain flexion of the head, with any available instrument, I put forward the suggestion to those who are competent to criticize it, as it is completely outside my sphere. If it were found possible, by means of a specially designed forceps, to apply traction at these two points, or at the occiput alone, might it not help to reduce in some measure the incidence of tentorial tears in specially selected cases?

An analysis of the 50 cases of intracranial haemorrhage reported showed the following results.

Fifty per cent of the cases occurred in primiparae.

Twenty-six per cent of the infants were  $5\frac{1}{4}$  pounds or under.

The second stage was unduly short in 22 per cent of the cases, whereas it was prolonged in 18 per cent.

Forceps or other forms of traction were

Synopsis of Fifty Cases of Intracranial Haemorrhage, 96 per cent of which showed Injury to the Tentorium

		t	Firs	First stage	Second	Second stage	: 6	We	Weight	
NO.	Fresentation	Fara	Hours	Hours Minutes Hours Minutes	Hours	Minutes	Delivery	Pounds	Ounces	Tentorium
				Prematures	tures					
ï.	Breech II	6	7	29	1	20	Modified Prague	61	တ	Tear on right side of falx
63	Vertex II	64	13	ſ	က	35	Spontaneous	m	œ	Extensive bilateral laceration
က်	Vertex I	н	6	30	1	35	Spontaneous	4	7	Extensive bilateral laceration
	Vertex I	7	œ	1	1	50	Spontaneous	· tC	. 61	Bilateral laceration
'n	Vertex I	н	ıst and 2nd sta	and stage	0	15	Forceps	ייי ני	တ	Extensive bilateral laceration
9.	Vertex I	H	oi	1	1	20	Spontaneous	, m	7	Bilateral laceration
ċ	Vertex II	က	5 30	30	ı	15	Spontaneous	10		Bilateral laceration
ź	Breech	æ	ıst and 2	and stage	15	<b>o</b> ţ	Version and extraction	m	14	Very extensive bilateral lacera-
0	Vertex (twins)	<b>-</b>	1.7	1	۲	1	S. C.	,	•	
`	-	(	7	i	4	ţ	Spontaneous	m	IO	2nd twin: extensive bilateral laceration
10.	Breech	5	5	20	1	20	Braxton Hicks; modi-	5	7	Very extensive laceration
1	Torton D O D	,					fied Prague			
; ;	Vertex F.O.F.	Η,	ist and 2nd sta	end stage	12	1	Spontaneous	61	13	Tentorium and falx "in ribbons"
; ;	Verteen T	H	0	ı	1	20	Spontaneous	ις	1	Bilateral cerebral haemorrhage
÷,	vertex 1	н	ις	ı	63	30	Forceps	<del>। उ</del>	9	Tear right side
14.	Vertex II	н	13	ı	н	30	Easy forceps	· tr	Ž	Fytensive loceration
15.	Breech	n	I	i	l	, 1	Modified Prague	ာဖ	÷ -;	Small tear: sub-tentorial bleed-
16	170-40 1	•					ο.		<b>-</b>	ing,
; <u>t</u>	Vertex 1	٥	15	1	1	50	Spontaneous	7	1	Extensive laceration
./,	A CILCX I	н	17	1	က	20	Easy forceps	, . o	ņ	Haemorrhage into posterior
18.	Breech	4	!				; ;			
10.	Vertex III	9 6	4		ł	1	Modified Prague	ı	1	Extensive laceration
20.	Vertex I	ე ⊦	o ç	30	1 )	15	Spontaneous	7	∞.	Tears right and left side of falx
21.	Vertex	ł ⊨	Q 00	1 6	<b>-</b>	Io	Difficult forceps	7	4	Extensive laceration
		ť		5	24	10	Medical induction, forcens	7		Tear left side of falx
22.	Brooch						edono.			
į	Tono	ç	I	I	1	1	Braxton Hicks, modified	7	တ	Extensive bilateral laceration
23.	$\mathbf{Breech}$	4	Ist and and eta	and etage	ŧ		Frague, Forceps			
		<b>.</b>		ara stage	_	١ .	Drawton Flicks, modified Prague Forces	l	1	Extensive bilatéral laceration
24.	Vertex I	14	1st and	ist and and stage	1	ć	Cross trouceps	ď		
25.	Breech	• н	1st and 2nd sta	and stage	18	20 20 20	Spontaneous Braxton Hicks.	x	64	Extensive bilateral laceration
					•		Version and extraction	i	ļ	Extensive bilateral laceration

d Injury to the Tentorium (Continued)  Pounds Ounces  Pounds Ounces  Tentorium  ' 7 3 Extensive bilateral laceration  Extensive bilateral laceration  Extensive bilateral laceration  Extensive bilateral laceration  Bilateral laceration  Wholesale laceration  Extensive bilateral laceration  Bilateral laceration  Very extensive bilateral laceration  Wight side laceration  Bilateral laceration  Widespread bilateral laceration  Bilateral laceration  Small tear  Extensive laceration  Extensive laceration  Extensive bilateral laceration  Bratensive laceration  Extensive laceration  Extensive laceration  Small tear right side  - Tear right side  - Tear right side  - Tear right side  Small tear left side  - Small tear right side  - Extensive laceration  Extensive laceration  Small tear right side  - Extensive laceration  Extensive laceration  Small tear right side  - Extensive laceration  Extensive laceration  Extensive laceration  Small tear right side  - Extensive laceration  Extensive laceration
Para Hours Minutes Hours Minutes Delivery  I style and and stage Second stage Per cent of which showed  I style and and stage I so Forceps  I so Force
No. Presentation   26.   Breech   27.   Vertex P.O.P.   28.   Vertex P.O.P.   29.   Breech I   29.   Au.   Vertex II   19.

applied in 76 per cent of the deliveries, and breech births constituted 36 per cent, or more than one-third of the total. From these figures it may be assumed that the principle traumatic factors tending to produce intracranial injury are associated with breech deliveries, with too short or too prolonged a second stage, particularly in premature labour and with difficult forceps extraction. It will be noted that exactly one half of all the cases occurred in primiparae.

#### DIAGNOSIS.

The diagnosis of intracranial haemorrhage is rendered difficult by the fact that the examination is purely objective and clinical methods of approach have little value where the central nervous system of the newborn is under consideration. The tendon reflexes are inconsistent and often misleading. Examination of the retina is difficult, and in addition has been reported to show haemorrhage as a result of congestion in 20 to 50 per cent of all deliveries, according to different observers.

The pyramidal tracts are non-medullated, and presumably not functioning, which rules out the fore brain as an aid to localizing the trouble. The fontanelle may be bulging in cases of gross haemorrhage or in cerebral oedema, but may appear completely normal where the haemorrhage is small or localized infratentorially. is a sound policy to treat every case of asphyxia as an intracranial haemorrhage until proved to be otherwise. The birth history is often of great assistance in making a diagnosis. The infant may show coma or drowsiness and refuse to suck, or may be extremely restless and irritable with a "cephalic" cry, and a tense, terrified expression. Vomiting for no apparent reason is sometimes a symptom. A slow pulse and rapid, shallow breathing, com-

sometimes with thermolability, bined lethargy, coma or cyanotic attacks may be associated with haemorrhages involving the medullary area. Rigidity of the neck with opisthotonus or head retraction are often associated with the latter. Convulsions are relatively common and are always gravely suspicious of intracranial damage. The Moro reflex, although present in cerebral oedema, is one of the most valuable aids in diagnosis. It is also known as the "startle" reflex, and occurs in the normal infant whenever it is suddenly moved or gets a fright for any reason. Although there are various methods of producing it, in my opinion, the simplest way is to grasp the legs at the ankles and give the baby a sudden, small jerk. The normal infant responds to this with a quick abduction and adduction of the arms, as if to grasp and encircle some object. This reflex is absent or very diminished in intracranial haemorrhage. Although it may also be absent in intracranial oedema, it returns rapidly as the oedema subsides. It is not advisable, in my opinion, to use lumbar puncture for diagnostic purposes until other possibilities are excluded, such as atelectasis, hypoglycaemia, tetany, congenital heart and so on. Even then the results may be misleading, as the fluid may be clear in the presence of haemorrhage.

Opinions vary considerably as to the use of lumbar puncture. Bland (1935) advises lumbar puncture in suspected cases, whereas Levinson (1935) suggests that blood in the cerebrospinal fluid has no significance, unless present in large amounts under pressure, and that the cerebrospinal fluid may be clear in the presence of gross haemorrhage. On the other hand, Brennemann (1940) warns us that lumbar puncture may do harm by producing further haemorrhage, and favours conservative treatment.

We favour an intermediate course with

Four photographs showing the falx and tentorium in a formalin fixed dissection. The instruments used for traction have been blocked out, and are not shown in these reproductions.



Fig. 1

The effect of slight anteroposterior pressure on the skull with finger and thumb.



Fig. 2. Willetts forceps and one-pound pull on scalp.



Fig. 3. Willetts forceps and two-pound pull on scalp.



 $${\rm Fig.}\ _4$$   $T_{\rm Wo\text{-}pound\ pull\ from\ occiput\ and\ chin.}$ 

a tendency, if any, towards the conservative side. If there is definite evidence of increased intracranial tension plus a bulging fontanelle, lumbar puncture is done merely to relieve abnormal pressure. there are symptoms of intracranial damage without marked evidence of pressure, we treat the case conservatively. Lumbar puncture is a disturbing operation for an infant that should be kept at complete rest. The removal of the cerebrospinal fluid may possibly loosen a clot that has formed at the bleeding point, and thirdly, the forcible folding of the infant to produce the convex spinal column necessary for the lumbar puncture may quite conceivably produce renewed haemorrhage at the bleeding point. A diagnosis of the site of the haemorrhage is not as a rule possible, though in some cases an attempt may be made to decide whether the bleeding is above or below the tentorium. In the former group the convulsions, if any, tend to be clonic in character. There is generally some facial twitching and rolling of the eyes. A tense fontanelle may be present and the infant is restless and crying excessively. In infratentorial haemorrhages, the infant often shows early head-rigidity, often with marked head-retraction. There are frequently attacks of cyanosis with coma or lethargy. Death generally ensues from paralysis of the vital centres. Convulsions, if present, tend to be of the tonic variety. In some cases of course, there may be a combination of haemorrhage both above and below the tentorium.

#### TREATMENT.

As in any intracranial injury, complete rest and the avoidance of any violent resuscitative efforts are essential. Vitamin K is given and sedatives are used freely. The use of lumbar puncture has been discussed under diagnosis. Respiration may require stimulation, and oxygen, or

mixtures of oxygen and carbon dioxide, should be available; all ordinary feeding is stopped and fluids or feeds are administered in small amounts by gavage. Riesenfeld (1931) feels that posture is important and keeps the infant in an upright position for 8 to 10 days.

Apart from these measures there is little the paediatrician can do and treatment, in order to be successful, must develop along prophylactic lines.

I have endeavoured to show the principle factors involved in 50 cases of intracranial injury. If we can evolve some satisfactory method of dealing with even one of these contributory causes, we shall reduce our neonatal mortality accordingly.

To the Professor of Anatomy, University College, Dublin, and his assistants for the dissections and photographic reproductions, and to Professor McGrath and Dr. Geoghegan of the Pathological Department, National Maternity Hospital, I record my thanks.

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# Acute Inversion of the Uterus Treated by Huntington's Operation

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AND

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Acute inversion of the uterus is a very rare complication of parturition and for that reason few obstetricians have much experience in its treatment. This paper records the successful use of an operation which is apparently little known in this country.

It is generally taught that immediate digital replacement per vaginam is the method of choice, and Barrett (1945) stresses how easy this is if it is undertaken at once before oedema of the uterus and a tight constriction ring develop, but once these are present replacement becomes very difficult (Berkeley, Bonney and MacLeod, 1938). Munro Kerr (1937) describes the ring as Bandl's ring and not the cervix O'Sullivan (1945) described new method of accomplishing replacement when taxis had failed; he used a vaginal douche under hydraulic pressure with the introitus closed and effected reduction of the inversion in z cases: the same method was used successfully by Spitzer (1945) but Dawson (1943) and Norton (1944) found that vaginal replacement was impossible when much oedema of the uterus had occurred. Some authors recommend the use of adrenalin  $\frac{1}{2}$  to 1 ml. (1:1,000 solution) which was first advocated by Urner (1933). If vaginal replacement fails it is usually taught that if the patient survives the initial period of shock, the uterus may be replaced during the puerperium by

Aveling's repositor, but occasionally spontaneous rectification may occur; Comyns Berkeley (1915) found that this was aided by a vaginal douche. If the condition becomes chronic replacement may be effected by vaginal or abdominal operations such as those of Spinelli and Haultain.

Huntington (1921) described an abdominal operation which he had used in I case in the acute phase when vaginal replacement had failed and the patient was still bleeding. The haemorrhage and shock were treated by blood transfusion before and during operation and she recovered. Its successful use was recorded in 7 more cases by Huntington, Irving and Kellogg (1928) and Irving and Kellogg (1931). In 4 of these, vaginal replacement had been tried and the vagina packed for haemorrhage before abdominal operation. Two further successful cases have been recorded by Dawson (1943) and in I of these two attempts at vaginal replacement had been made at 24-hour intervals prior to Huntington's operation. In only I case so far recorded has a patient died following Huntington's operation for replacement of the uterus (Harer and Sharkey, 1940) but details are not given as to whether she had transfusion-therapy. Irving (1943) recommended that the operation should be used without even attempting vaginal replacement. This was because the operation does

not increase shock or haemorrhage, which vaginal manipulations tend to do, and it is technically simple, taking only 15 minutes to perform.

The technique consists of an abdominal incision about 3 inches long to expose the inversion cup. The operator and his assistant, using Allis's forceps, grasp the posterior uterine wall on either side, about  $\frac{3}{4}$  inch below and inside the inversion cup and draw it up. A further 2 pairs of Allis's forceps then grasp the uterus at a lower level and elevate it; the first pair are then removed and re-applied below the second and so on until the fundus is up and reinversion is complete. Any small abrasions in the uterine wall caused by the forceps are sutured with catgut. The abdomen is then closed. Irving and Kellogg (1931) described a modification in technique using Allis's forceps at one uterine cornu only and they found the reposition successful in the 2 cases so treated.

Our object in recording this case is to recommend the extended use of Huntington's operation in cases where vaginal replacement of the inverted uterus fails, bleeding continues and the patient remains shocked. The improvement in general condition after abdominal replacement of the uterus is dramatic, and bleeding stops immediately.

Restorative measures, including blood-transfusion are, of course, continued until the patient's condition is quite satisfactory and her blood-loss has been made up.

#### CASE RECORD.

A 2-gravida, aged 27 years, first pregnancy and labour in 1945 were uneventful; the child weighed 7 pounds.

The second pregnancy was normal. Spontaneous delivery took place on 19th June, 1947, at home, attended by a midwife, after 7 hours in the first stage and 20 minutes in the second stage of labour; the child weighing 8 pounds 4 ounces.

Severe postpartum haemorrhage commenced 4 minutes after delivery of the child. A doctor, who was called by the midwife, expressed the placenta by Credé's method about half an hour later; during the procedure the cervix appeared at the vulva. Haemorrhage continued and admission to hospital was sought.

On arrival of the ambulance at her home the patient was found to be too shocked to move and one of us (R.A.K.) went out and started a blood transfusion. The patient was just conscious, her pulse was barely palpable at the wrist at about 120 beats per minute, and the blood-pressure was not recordable. After half a pint (280 ml.) of blood her condition was slightly improved, but suddenly she cried out with pain in the lower abdomen and said she wanted to push (as so vividly described by Norton, 1944) a further loss of about 4 ounces (110 ml.) of blood occurred, and she became more shocked. It was then discovered that the uterus was inverted, the inversion cup being just below the level of the umbilicus. It had a very tight ring about 11/2 inches in diameter and the bulky uterus was palpable in the lower abdomen below the cup. Bleeding continued and her condition deteriorated again. Morphia gr. ¼ was given and a further 11/2 pints (850 ml.) of blood, and then it was decided to transfer the patient to hospital with the drip continuing, as it was obvious that her condition would not improve until the uterus was replaced.

On arrival at hospital her condition was very poor. She was cold and sweating with pulse 110 and blood-pressure 60/?. She was still bleeding in a steady trickle which was faster than the transfusion would run in. The uterus was soft, flabby, and very bulky but the inversion cup remained a hard rim at about 1 inch below the umbilicus. Attempts were then made by one of us (P.G.) to reinvert the uterus under gas, oxygen and ether anaesthesia. The first method used was a vaginal douche with as much hydraulic pressure as possible but because the transfusion was running into the left leg and she had a perineal tear, difficulty was found in closing the vaginal orifice adequately. Then digital replacement was tried, using the cup to supply the point d'appui and an effort was made to dilate the ring through the abdominal wall. The flaccid cervix was felt as a thin rim in the vaginal vault below the constricting ring. These attempts at replacement were of no avail, therefore a pack

was inserted in an attempt to stem the bleeding which had been increased by manipulation. The patient was now having her fifth pint of blood, and a second transfusion was started in the arm in order to try to keep up with the blood loss. Bleeding continued through the pack and the patient's condition showed no improvement, her pulse was 120 and blood-pressure 66/? This was 6½ hours after delivery.

She was then seen by another of us (M.A.M.B.) who decided that Huntington's operation should be performed. This was carried out using the technique originally described by Huntington, under cyclopropane anaesthesia. The ease of the operation was confirmed and the fact that it takes only 15 minutes to do. The patient's condition improved immediately and the bleeding stopped. A further 1½ pints (850 ml.) of blood was given to combat her anaemia, making 9 pints (5,100 ml.) in all. An hour after operation she was conscious, her pulse was 100, blood-pressure 100/60 and colour good.

She was given penicillin prophylactically immediately before and after operation. Only mild pyrexia developed, up to 100.6°F. on the second evening, and subsequently her temperature was normal and progress uneventful. Her haemoglobin was 8.4 g. (55 per cent) on the third day postpartum and she was discharged on the 14th day with the baby breast-fed. Six weeks after delivery her uterus was well involuted and anteverted, the cervix felt normal and her haemoglobin was 12.8 g. (83 per cent).

#### SUMMARY.

- I. The treatment of acute inversion of the uterus is discussed and Huntington's operation is recommended where vaginal replacement fails.
- 2. The technique of the operation is described; its ease and rapidity are stressed and the fact that it can be undertaken when

the patient is shocked provided restorative measures, including blood-transfusion, are given.

3. A case is recorded of acute inversion treated by Huntington's operation after attempts at vaginal replacement had failed.

We wish to express our gratitude to Dr. Alan Rankin (Anaesthetist) and to the midwives and theatre sister concerned for their co-operation and very great help in the treatment of this case.

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## The Effect of Pregnancy on the Translucence of the Mammary Gland

BY

#### L. Halberstaedter, M.D.

(From the Radium Institute, Rothschild-Hadassah-University Hospital Jerusalem.)

In 1931 Cutler described a method of transillumination of the mammary gland as an aid in the diagnosis of breast tumours.

In examining several hundred women with suspicious lumps in the breast, we found that Cutler's method was a very helpful supplement to the routine physical technique of the examination of the breast. It is especially useful in the early stages of malignant tumours. However, we found it impossible to use this method in the diagnosis of breast tumours during pregnancy. In such cases the mammary glands were only slightly translucent. By the 4th month of pregnancy breasts were almost completely opaque.

We therefore endeavoured to find out:

(I) At what stage after conception translucency of the breast first begins to diminish (later to disappear completely).

(2) How far this sign can be used as a proof of pregnancy and as a method of differentiating between certain pathological

processes and pregnancy.

The normal mammary gland in women of different ages and constitutions always shows a reddish light if transilluminated with a small electric bulb in a dark room. Generally both breasts are of equal translucency. The nipples and areolas around are translucent if not darkly pigmented. The brightness varies in different individuals, depending on the volume and the

degree of firmness of the breast. The breast is more transparent in elderly women, women who have nursed babies or given birth. In case of pregnancy the translucency is uniformly diminished without sharp boundaries throughout the breast, and is almost identical in both sides. This is quite different from the circumscribed shadow in an otherwise clear breast which indicates a pathological process.

The transilluminated breasts are less translucent in early pregnancy and become progressively darker in the ensuing weeks. Then the light from the electric bulb, which easily passes through a normal mammary gland, cannot penetrate the similar sized breast of a pregnant woman.

The translucency begins to diminish markedly in about the 7th week of pregnancy and sometimes 2 weeks later. This change, characteristic of pregnancy, is termed "positive for pregnancy".

It must be mentioned that in the first 3 months of pregnancy, when the breasts are not completely opaque, it is not easy to clearly determine that the translucency in a particular case has really diminished. We had the opportunity, in some of our patients suffering from slight mastopathia, to transilluminate the breast before and after pregnancy. In these cases we could trace, from the beginning, the influence of pregnancy on the translucency of the breasts.

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To test the usefulness of this method in the diagnosis of pregnancy we asked the Department of Gynaecology and Obstetrics (Professor B. Zondek) to send us a number of pregnant and non-pregnant women for transillumination. We received no details concerning these cases from that department. We ourselves asked no questions and only applied the transillumination test.

After writing our report, we received the case histories from the Department of Gynaecology. We called the result "positive" only if it was unmistakably clear. If the result was questionable the patient was again examined 1 or 2 weeks later. In all the non-pregnant women the reaction was negative.

Out of 5 women in the 6th week of pregnancy, 3 gave "positive" results. One of the 2 patients showing a "negative" result had had a recent abortion and was not reexamined by transillumination. Five of 7 women in the 7th to the 8th week of pregnancy gave "positive" results, and the same "positive" results were found in this series in all 5 women in the 2nd and 3rd month of pregnancy. It is not of special interest for diagnostic purposes that in cases of pregnancy in the 4th month and later, the results were "positive".

The test was of actual diagnostic help in the following 2 cases:

#### I. Patient S. A.

Diagnosis. Ovarian cyst or extrauterine pregnancy? Transillumination. "Positive for preg-

Transillumination. "Positive for pregnancy."

Immediate operation. Proved extrauterine pregnacy.

#### 2. Patient Z. W.

Diagnosis. Suspected extra-uterine pregnancy.

Transillumination. "Positive for pregnancy."

Operation. Proved extra-uterine pregnancy.

(Aschheim-Zondek Reaction "Positive".)

Three patients with galactorrhoea were examined, 2 of them suffering also from amenorrhoea, and 1 from a pituitary tumour. It is interesting to note that in spite of the secretion of the milky fluid the breasts were clearly translucent. None of these 3 women was pregnant.

In I case of pregnancy we were surprised to find one breast more translucent than the other. Afterwards we heard that the more translucent breast had given less milk after previous births.

Besides this series we found that in some cases the test could not be clearly recognized as positive although the women were in the 3rd month of pregnancy.

For the time being we can establish that in the first 6 weeks of pregnancy the breasts are still clearly translucent. In the period between 6 to 10 weeks the translucency begins to diminish, but there is not an objective method of determining the degree of reduction of translucency in an individual case; that can be done only after experience has been obtained in a great number of cases. After 10 weeks the fading of the translucency is easier to determine and, in almost all cases, after 12 weeks the breasts are, with only a few exceptions, opaque.

### TECHNIQUE.

Like Cutler, we used a small electric bulb of 6 to 8 volts fixed at the end of a curved rod. The bulb is connected with a small transformer (ca. 15 to 20 watt). The intensity of the light is regulated by a rheostat adjusted to the size of the patient's breast. The examination was done in a dark room after adaptation of the examiner's eyes.

#### SUMMARY.

The translucency of the normal breast diminishes during pregnancy. The change usually first becomes evident in about the 7th to 8th week of pregnancy. A decrease of translucency of the breast may indicate pregnancy. This sign can be useful in some cases as a quick and easy method of differ-

entiating between pregnancy and other processes, but only if it is clearly positive.

I am indebted to Professor B. Zondek and Drs. Bromberg and Brzezinski for their interest and assistance.

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### Elderly Primigravidae

BY

P. C. DUTTA, O.B.E., F.R.C.S., D.G.O., Lt.-Col. I.M.S. Professor of Midwifery and Gynaecology, Glancy Medical College, Amritsar, India.

THERE has been a certain amount of discussion whether the term should be elderly primiparae or primigravidae. Although the former term is in common use, for obvious reasons it is preferable to use the latter.

All obstetric textbooks warn us of the difficulties of labour in elderly primigravidae, the popular conception being that owing to rigidity of the soft parts trouble is to be expected.

It is well that these women be classified into 2 main groups: (1) Those who did not have an opportunity for getting pregnant earlier due to late marriage or other such reasons and (2) those who did not get pregnant despite early marriage or other opportunities of being pregnant. I consider this classification important for proper prognosis and management of labour.

Some authorities (Rucker, 1935; DeLee and Greenhill, 1943a) take 30 years as the lower age limit for definition, while others (Stander, 1945; Nathanson, 1935; Kuder and Johnson, 1944) prefer 35 as the minimum. In India, where the average woman matures, procreates and ends her sexual life earlier, the minimum should be 30 if not less: I usually take 26 as the lower limit.

Rucker (1935) noted the following in an analysis of 553 cases of primigravidae above the age of 30. The average duration of labour was 16.8 hours. Premature rupture of membranes was the commonest complication. Perineal rigidity with consequent laceration and third-degree tears were rather common. The third stage was found to be especially troublesome and dangerous. Association of pregnancy with fibroids was more common. Incidence of toxaemias was 3 per cent; placenta praevia, 3 per cent; infant mortality, 15 per cent; and female children were more commonly produced than males.

Nathanson (1935) found that the justominor pelvis was more common among the younger members of the group and the funnel pelvis among the older. So, dystocia was more common at the inlet among the younger and at the outlet among the older women. There was a higher incidence of persistent occipito-posterior and breech presentations, 21.9 and 6 per cent, respectively, nearly twice as high as the general run. Duration of labour was longer and there was greater incidence of malpresentation; uterine inertia was 9 times more frequent. The pelvic synchondroses are rigid and nutation of sacrum is absent, making further causes of delay in delivery. All these are also liable to cause laceration and infection in the mother and cerebral injury and asphyxia in the child. Stillbirths are 3 times higher than normal. The incidence of Caesarean section was 11 per cent and it was noted that the age of the patient was not the main indication in most cases but pelvic deformity, non-dilatation of the cervix or progressive toxaemia. associated conditions in the elderly primigravida are of great importance apart from the effects of her age. Complications in the third stage are twice as common. Post-partum haemorrhage from lacerations and atony of the uterus is common. After-effects of delivery on the nervous system are often pronounced and the puerperium is prolonged. Maternal mortality was 1.6 per cent compared with nil in the younger group studied. Nathanson particularly mentions, and my findings confirm, that these patients often suffer from menstrual irregularities. Those associated with delayed onset of menstruation seemed to influence the type and duration of labour.

Lundh (1926) was the first to draw our attention to the association of elderly primigravidity with under-development of the genitalia. Horner (1927) described a more or less clearly defined class of difficult labour which DeLee and Greenhill (1943b) named "Dystrophia-dystocia Syndrome". The main features of this syndrome are a slightly justo-minor or masculine type of pelvis with girdle obesity and signs of dystrophia adiposogenitalis (hypopituitarism), small cervix, narrow rigid vagina, aged primigravidity, postmaturity of the child, non-engagement of the foetal head when labour begins, posterior position of the occiput, premature rupture of membranes, weak pains with protracted firststage, familial dystocia and a tendency to eclampsia.

Horner's description (1927) of these patients is illuminating. The woman's difficulties begin before or shortly after marriage with menstrual irregularity and sexual apathy. Pregnancy is delayed, it may be for many years. The patient is usually short, stocky, with relatively long torso and short thighs. There is a tendency to masculinity. The bones of the pelvis are thick and heavy, the pubic arch narrow and of the masculine type, the vagina tight and shallow, and the levatores often rigid. These

women are subject to endocrinal disturbances and have a tendency to toxaemia and abortion. Owing to under-development of the genitalia, atony of the uterus is common, cervical tears are frequent and lacerations of the soft parts extensive, so that at the end of the labour one often feels that, in anticipation of these difficulties, Caesarean section would have been the better choice.

The association of genital hypoplasia and delayed conception is well known. In these women, although opportunities for pregnancy are there, pregnancy does not occur. These are also patients whose pelves are under-developed or of the justo-minor type or, due to some endocrine disturbance, the pelvis has a tendency to be android, and there is weak or irregular uterine action during labour. The association of genital hypoplasia and deformity of pelvis causing complications in labour was described by me in 1928. Much of the haziness of our knowledge of genital hypoplasia and endocrinology has since been cleared up. Dystocia associated with this type of elderly primigravida can be reasonably attributed to endocrinal dysfunction causing genital hypoplasia, delayed conception, uterine weakness and pelvic deformity, which all add to the difficulties of the case apart from the rigidity of the soft parts.

Elderly primigravidae are not common in India because of existing social customs which favour early marriage. The incidence, as I could gather from the morbidity-rate of the Lady Willingdon Hospital Reports for 1937–1938, was 4 per cent, but as morbidity is likely to be twice as common among elderly primigravidae, the corrected figure would be 2 per cent at the most, taking 26 years as the minimum age. If 30 is taken as the minimum age, it will be less than 0.5 per cent. In hospital practice one practically never sees examples of the

first group—those in whom late pregnancy is due to late marriage. The few we see belong to the second group in whom pregnancy did not take place in spite of opportunities for conception being present, the probable cause being genital abnormality, either hypoplasia or dystrophia. In private practice one see more patients belonging to the first group but, compared with the hypoplastic group, they are far less numerous.

#### CONCLUSION.

It is therefore considered important that in every case of an elderly primigravida one should find out if delayed pregnancy is due to under-development of the genitalia, with or without pelvic deformity, or to lack of opportunity of being pregnant. In the latter, management is more or less easy. Difficulty will be caused only by the soft parts—cervix, pelvic floor and perineum—and can be overcome by more or less simple measures.

If, on the other hand, delayed pregnancy is due to genital hypoplasia, the problem is more formidable. One important factor which must be taken into consideration is that there is very little likelihood of another pregnancy, more especially so if manipulations and interference cause infection. In many cases belonging to this group is found one-child sterility. The woman has a certain amount of hypoplasia, becomes pregnant, and then, due to trouble in labour or infection, mild or severe, her already existing sub-fertile condition proceeds to complete sterility. Such patients often present themselves in our clinics, and on examination one finds under-development of genitalia which is often wrongly attributed to lactational atrophy.

Therefore, in the management of all elderly primigravidae, a careful examination should be made to find if there is associated genital hypoplasia. If signs of this are present they are of ill omen: every endeavour must be made to avoid unnecessary risks in pregnancy and labour, and no effort should be spared to get a child that will survive, as there will be very little chance of another pregnancy. In all cases prenatal care is of extreme importance and hospital facilities for delivery most necessary.

#### SUMMARY.

- I. Elderly primigravidae should be classified into 2 groups: (a) Those whose condition is due to genital hypoplasia and subfertile condition.
- (b) Those who have lacked earlier opportunity of being pregnant.
- 2. Prognosis is worse in those with genital hypoplasia, and great care and attention are necessary during labour.
- 3. It must be borne in mind that there is little chance of another pregnancy in patients with hypoplasia.

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### A Case of Double Tubal Pregnancy

BY

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SIMULTANEOUS pregnancy in both the Fallopian tubes being very rare, it is considered worthwhile publishing this case.

A married woman, aged 18 years, was seen in her second pregnancy. Her first pregnancy and labour, 18 months previously, were normal. Menstruation started at the age of 14 years, regular, 3 to 4 days, 30 days' interval. The last menstrual period was 6 weeks before. About 8 days before admission to hospital she had acute pain in the abdomen. Bleeding per vaginam started 5 days before admission, and 3 days before admission she noticed a mass in the lower abdomen.

Condition on admission. Pulse, 90; blood-pressure, 115/80 mm. Hg.; temperature 98°F. An abdominal mass was felt about 5 fingers above the symphysis pubis, globular, bigger and more resistant on the right, although tense fluctuation could be elicited throughout. The body of the uterus was rather indefinite and merged with a large tender swelling, in the pouch of Douglas,  $5 \times 3\frac{1}{2}$  inches (11.5  $\times$  8.7 cm.).

Operation. The abdomen was opened by right paramedian incision. The body of the uterus was pushed forwards and upwards and fixed. The omentum and intestines were adherent to the top and front of the fundus. Both the Fallopian tubes were behind the adhesions and were hidden from view on opening the abdomen. The pouch of

Douglas was thus completely cut off from the peritoneal cavity in front of the uterus and no blood. was visible on opening the abdomen. On separating the adhesions from the top of the fundus masses of dark clotted blood escaped. After evacuating the blood it was found that there was a ruptured tubal pregnancy in the left Fallopian tube. On examining the right tube there was found a dark swelling about 1/2 inch in diameter (1.25 cm.) in the ampullary part of the tube. The ostium was occluded and it appeared that there was a small haemorrhage in the lumen of the tube, which, on further examination was found to contain what looked like a pregnancy. The part of the tube was excised and pregnancy was confirmed by histological examination. There was a distinct corpus luteum present in the right ovary. Pregnancy in the ruptured (left) tube was also confirmed by histological examination. The left ovary was adherent to the tube and other structures and was damaged during separation of adhesions, so it could not be ascertained if there was another corpus luteum in it.

Comment. Although double tubal pregnancy is very uncommon, in every case of tubal gestation the other tube should be examined. In this case if the unruptured tube had not been discovered and dealt with, the case might have ended fatally.

#### The Difficult Dilatation\*

BY

E. FARQUHAR MURRAY, M.D., F.R.C.S., F.R.C.O.G..

Professor of Midwifery and Gynaecology, University of Durham.

DILATATION of the cervix in most cases of dysmenorrhoea or sterility or menorrhagia is technically easy.

In others difficulty is met with at the internal os. One hesitates to use force in case the cervix is torn with the volsellum or the uterus perforated with the dilator. A uterine sound, bent to a suitable angle,

can usually be passed, but a dilator does not allow of this being done. The following procedure will meet with invariable success. When the difficulty is first met with continue the dilatation with the subsequent dilators up to size 8 Hegar. No attempt should be made to pass the internal os. Then start again with the smallest size, when a passage will easily be obtained until the largest size has been used. The dilatation of the cervical canal results in a dilatation of the internal os.

<sup>\*</sup>A communication read before the North of England Obstetrical and Gynaecological Society, June 1947.

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JAMES ROBERT GOODALL

## **Obituary**

## JAMES ROBERT GOODALL

O.B.E., M.D., F.R.C.O.G., F.A.C.S.,

1877—1947

DR. GOODALL was born at Ottawa in 1877. His preliminary education was in that city, where he graduated as gold medallist from Ottawa College. The Bachelor of Arts degree was awarded from McGill University in 1899 and in 1901 he received the M.D., C.M.

Graduate studies were completed in Montreal, Edinburgh, Paris and Berlin. During this time he was keenly interested in the study of ovarian neoplasms. On the completion of an outstanding monograph with reference to this subject he was awarded the Dector of Science degree from McGill in 1911. In 1912 he was appointed clinical professor in the Department of Obstetrics and Gynaecology. Since then he was an active member of McGill and several Montreal hospitals which include the Royal Victoria Montreal Maternity, Homeopathic, St. Mary's and the Jewish hospitals.

His continuous contribution to Montreal medicine for a forty-year period was interrupted only for five years. This was during the first World War, Sept. 1914 to Sept. 1919, when he served as medical officer with the 5th Mounted Rifles. He was wounded on three occasions and was three times mentioned in dispatches. He also served at military headquarters in London and was decorated with the Order of the British Empire.

During his medical career Dr. Goodall received many honorary and other degrees including the F.A.C.S., F.I.C.S., and

F.R.C.O.G., the D.Sc. of Edinburgh and Chicago. He was a prolific writer and made many valuable contributions to this Journal and to Americal medical journals. In addition to his monograph on ovarian neoplasms he is best known for his book on endometriosis, on which subject he was classed as an authority.

Outside of his profession he took a keen interest in various endeavours. He had a wide knowledge of modern literature and was an accomplished linguist, being able to converse in five languages. Music was one of his hobbies. In later years he became interested in philosophy and though many of his friends were not totally in accord with his ideas, they were agreed that his approach was stimulating and thought-provoking. At the time of his death Dr. Goodall was working on a philosophical monograph entitled Religio Chirurgi and had recently presented a paper in Toronto on the History of Man's Concept of the Soul.

Dr. Goodall was active until the day of his death. He performed a major operation in the Royal Victoria Hospital a few hours before he was suddenly stricken. He died on September 25, 1947.

His students, colleagues and friends will remember him as an accomplished teacher, a surgeon of unusual dexterity and a great gentleman.

He is survived by his wife, a son and two daughters.

# ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

A Meeting of the Council was held in the College House on Saturday, 24th January, 1948, with the President, Mr. William Gilliatt, in the Chair.

The following were admitted to the:

Fellowship of the College.

William Allan Dafoe.

Membership of the College.

Segulla Jacob Aptekar. Solomon Bender. Elizabeth McCallum. Dorothy Mary Satur.

The following candidates were elected to the Membership of the College.

Sidney Graham Aitken. Sylvester Campbell Anderson. Islay Cecil Barne. Wallace Barr. Fred Benjamin. Margaret Ellen Mary Boulton. John Montgomery Bowen. John Campbell McClure Browne. Ellsworth Cullen Bryant. James Taylor Burrowes. Richard Waywell Burslem. Agnes Urquhart Campbell. Alan Waugh Chester. John Crawford. Leslie Albert Cruttenden. Peter Cronshaw Denham. John Dunlop. Sidney Evans. John Frederick Foulkes. Dennis Charles Galloway. Stanley Frederick Hans. Betty Hargreaves. Jason Hobert Hassard. Rosa Hertz. John Bain Hurll. Philip Seukaran Jaikaran. Mary Soutar Jolly. Edward Wynne Jones.

Michael Maurice Kriseman. Sylvia Lerer. Una Gertrude Lister. Florence Pamela Logan. James Theodore Louw. Samuel Douglas Loxton. Silvia Celeste Lucas. Donald Stafford Matthews. Aaron Michel Michalowsky. Narotamdas Vithaldas Mody. Cecilia Mitchell Murray. George Stuart Musgrove. Maurice James Dewar Noble. Khorshed Pasricha. Ramanlal Girdharlal Patel. Andrew Ebert Perera. Peng Teik Por. Robert Williamson Kinross Purser. Theodore Francis Redman. Otto Arnold Schmidt. Francis Shaw. Benjamin Henry Sheares. Donald Moffat Sheppard. Bahman Schrabji Surti. David Alexander Thomson. John Granville Thurston. Shree Nath Upadhyay.

At the same meeting Sir William Fletcher Shaw agreed to accept an invitation from the members of the College in Canada to visit them on behalf of the College. He hopes to leave England in April, and will visit various centres to discuss with the Fellows and Members of the College matters affecting practice of obstetrics and gynaecology in the Dominion.

### Royal College of Obstetricians and Gynaecologists

58, QUEEN ANNE STREET, LONDON, W.1

# Prize Essay

A prize of £50, offered by a Fellow of the College, will be awarded for the best essay embodying original work or observations on the

## "Physiology or Management of the Third Stage of Labour"

Essays must be typewritten and should not exceed 2,000 words. The prize-winning essay will be published in the Journal of Obstetrics and Gynaecology of the British Empire.

Entries will be accepted from medical practitioners in the British Commonwealth, and must be submitted to the Secretary before 31st December, 1948.

The award will be made at the Spring meeting of the Council in 1949.

#### BOOK REVIEWS

"Progress in Gynaecology." By J. V. Meigs and S. H. Sturgis. Wm. Heinemann Ltd., London, 1947, pp. 552, 35s.

This book provides a welcome addition to gynaecological literature. In the preface it is stated that it is published for the purpose of "refreshing and bringing up to date those medical men who have spent the last years in the armed forces of their country."

The book is divided into sections, each dealing with a group of allied subjects. Many of the authors are of international reputation, and their articles carry the ring of authority, while providing at the same time an excellent epitome of their own more recent work. Markee's article on menstrual bleeding is a good example. Reifenstein's chapter on the adrenal cortex is an excellent presentation of a subject which tends to be neglected by gynaecologists, and Te Linde gives a studied and well-balanced appraisal of pre-invasive carcinoma. Sturgis has written an excellent chapter on amenorrhoea which goes far to clarify a difficult problem.

Not all articles are so good, however. That on leukoplakia, pruritus and senile vulvitis leaves confusion worse confounded, and the chapter on dysmenorrhoea is disappointing. In writing on the technique of sterilization Sturgis has given a surprising list of indications, including (without qualification) pulmonary tuberculosis and previous toxaemia. It is doubtless assumed that a discriminating eye will be employed.

It is inevitable that in a volume by 71 authors there should be some overlapping, and some difference of opinion. Thus Schiller and Novak each give a different development for the vagina, and Dockerty and Hamblen appear to differ as to the risk of uterine carcinoma attendant on the hyperoestrogenic state. Such difference, however, will perhaps serve to remind the reader that our knowledge on these subjects is still fluid.

Perhaps the most striking advance in therapy.

since the beginning of the second World War has been in the field of antibiotics. It is surprising therefore that so little space is devoted to it—the briefest of surveys has been made to suffice. In dealing with penicillin therapy in gonorrhoea, it might have been wise to mention the risk of masking a syphilitic infection acquired at the same time.

The article on venous thrombosis lays emphasis on the surgical aspects of treatment. Wholesale ligation of femoral veins seems a very drastic prophylaxis for the rare accident of serious pulmonary embolism, and one wonders whether this treatment will not be largely abandoned as opinion matures.

The book should prove of interest and of value to readers in this country, providing as it does a mosaic of modern American opinion in gynaecology.

The volume is well bound, clearly printed, and the illustrations are well reproduced.

"Obstetrics and Gynaecology." By G. Scott Russell. Oxford Medical Publications, pp. 211.

AFTER referring to the plenitude of obstetric and gynaecological textbooks, Professor Chassar Moir in his foreword speaks of this book as "different," and so it is, both in form and intention. Thus it should escape comparison, but it must be noted that while a certain popular Short Textbook of Obstetrics runs to 545 pages, Scott Russell's book contains but 211, including the section on gynaecology! Can this book then hope to serve well those to whom it is addressed in the preface, who "wish to pick up again the threads" or "care to revise their knowledge"?

It is true that the range of material and detail packed in so small a space is remarkable—one would choose here for praise the section on pelvic radiography—and the whole is most readable. But these very virtues cause misgiving. Within these narrow limits may seem to the reader to lie

BOOK REVIEWS 77

an easy mastery or remastery of the subject, and this is a quite unwarrantable assumption.

That there is much more to be taken into account than can be here compressed is clearly the author's view from the many references given in the text as a guide to further reading. But it must be remarked that probably many for whom the book is intended will not have ready access to the matter

cited. A bibliography of standard modern textbooks might, with advantage, be added in subsequent editions. For the present it is to be hoped that the book will stimulate to wider and deeper study rather than instil a sense of all-knowing.

study rather than instil a sense of all-knowing.

On pp. 91-92 it is stated that "0.25 mgm. digoxin = 1½ gm. of powdered leaf." Gm. must be a misprint for gr.

### REPORTS OF SOCIETIES

THE ROYAL SOCIETY OF MEDICINE
OBSTETRIC SECTION.
19th December, 1947.

Mr. Everard Williams introduced the subject of the management of cases of vesicovaginal fistula and divided ureter. After paying brief tribute to the pioneer work of Marion Sims he proceeded to describe the pioneer work of Trendelenburg with his suprapubic transvesical operation first performed in 1881. The technique of the operation was improved by the French urologist, Marion J. Paris, so that fittle remained to be modified at the present time. The transvesical operation is suited to all vesicovaginal fistulae of gynaecological origin now mounting in numbers until they out-number those of obstetric origin.

All high-lying obstetric fistulae (which are in close proximity to the ureter) are better repaired by the transvesical route, leaving the low-lying fistulae to be dealt with by the vaginal route. Mr. Everard Williams recommended early suprapubic cystotomy in place of conservative and expectant treatment for vesicovaginal fistulae and their early repair if spontaneous healing did not occur in a matter of a few weeks, so as to avoid the distressing complication of a contracted or thimble bladder.

With the complication of ureteric fistulae he recommended transplantation of ureters into the bladder (or, failing this, into the colon) in place of attempting to suture the divided ends because of the risk of development of hydronephrosis at a later date. Ureterosigmoid anastomosis was the method of election in dealing with fistulae that destroyed the urethral sphincter rather than attempting to

transplant pyramidalis or gracilis muscles and fashion a new sphincter in that way.

The early repair of ureteric lesions was more important than the early repair of vesical fistulae if permanent renal damage were to be avoided.

#### DISCUSSION ON VESICOVAGINAL FISTULA.

Mr. R. Ogier Ward, in the course of his opening remarks and reply, said that he supposed the Sims operation retained an unchallenged place for the usual type of fistula. For the extremely severe types seen amongst uncivilized races transplantation of the ureters was of great value, witness the excellent results obtained by surgeons in East Africa; a healthy rectum with a fully competent sphincter was an essential. Swift Joly's transperitoneal approach to the bladder with separation of it from the vagina was valuable in other severe cases. In high fistulae, particularly such as might result from gynaecological operations, a transvesical approach to the fistula, with careful excision and repair, combined with additional suture from the vaginal aspect, was usually successful, and was often so when the Sims method had failed; suprapubic drainage of the bladder was necessary. Preliminary cystoscopy, the vagina being packed and a flushing cystoscope used, would enable an accurate diagnosis to be made in all cases except those with very large fistulae. Excretion urography should not be omitted lest a ureteric fistula co-exist.

#### REVIEW OF CURRENT LITERATURE

The Journal is fortunate in being able to run this Review in conjunction with the Abstracting Service of the British Medical Association. All the abstracts of this service which cover obstetrical and gynaecological literature and literature on the new-born are at our disposal. The Review will, however, contain in addition abstracts of articles which, though not of sufficient general interest for publication in the monthly volumes published by the British Medical Association, are yet sufficiently important for a specialist journal. It is to be hoped that our readers will collaborate in the preparation of these abstracts. Those who are willing to take part in the service are invited to communicate with the Editor, The Abstracting Service, B.M.A. House, Tavistock Square, London, W.C.I. There is special need of abstracters in foreign languages, and when offering his or her services the writer should indicate the language (apart from English) in which he or she is proficient. The name of the abstracter will be acknowledged in the text and payment will be made at the rate of thirty shillings per thousand words.

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#### ANATOMY

1. The Pelvis with Horizontal Symphysis. (Le bassin à symphyse horizontale.)

By P. BRAULT. Gynéc. Obstét., 45, 824-826, 1946.

The author has had 25 years of practical obstetrical experience in an area where the effect of rickets is frequently seen in childbirth, and he describes a condition where the symphysis pubis adopts an almost horizontal inclination. He states that in a normal woman the diagonal conjugate makes an angle of 95 degrees with the symphysis pubis. In the cases he describes this angle is reduced to 45 degrees.

In labour this anatomical peculiarity causes the anterior parietal bone to override the upper border of the symphysis pubis, giving rise to asynclitism. The author is of the opinion that delivery should be completed, not by forceps, but either by Caesarean section in the case of gross disproportion, or by internal version in minor degrees of disproportion. Indeed, he makes a plea for the more frequent employment of internal version in such cases.

G. Gordon Lennon

2. A Method of Radiopelvimetry of the Pelvic Inlet. (Une méthode de radio-pelvimétrie du détroit supérieur.)

By P. Rosa. Gynaccologia, Bascl, 123, 137-166,

Mar., 1947. 14 figs., 5 refs.

An accurate method (an elaboration of Von Schubert's method) is described for the determination of the true conjugate diameter of the pelvic inlet and of the inclination of the plane of the inlet to the vertical. Both can be determined from a lateral radiograph of the pelvis taken with the patient in the upright position. Before radiography a graduated notched metallic ruler is inserted between the thighs of the patient as high as it will go and accurately placed in the sagittal plane of the patient. The patient is then placed in the Albert semi-sitting position. As the inclination of the pelvic brim to the vertical is known from the lateral view. the pelvic brim can be so adjusted as to make it exactly parallel to the plane of the film. A notched metallic rule is placed in the plane of the brim and a radiograph of the brim and rule is obtained. On this radiograph all the other diameters of the pelvic brim can be read. The author claims an accuracy up to 2 mm. for this method.

A. Orley

3. Critical Evaluation of External Pelvic Measurements. (Kritik an der äusseren Beckenmessung.)

By H. Hosemann. Zbl. Gynäk., 69, 49-55, 1947-3 figs.

4. Determination of the Size of the True Conjugate from the Radiograph by Means of the "Magnification Triangle". (Die Grossenbestimmung der Conjugata

vera dem Röntgenbild mit Hilfe des "Vergrösserungs-dreieckes".)

By L. PREISSL. Klin. Med. Wien., 2, 272-275, Mar. 15, 1947. 3 figs.

5. Histological Changes in the Ovary and Genital Tract of the Adult Rat on a High Protein Diet. (Modifications histologiques de l'ovaire et du tractus génital de la rate adulte soumise au régime hyperprotidique.)

By H. Tuchmann-Duplessis and P. Aschken-ASY-Lelu. C.R. Soc. Biol., Paris, 141, 689-690, July 5, 1947.

#### PHYSIOLOGY

6. Thyroxine and Vitamin C in Relation to Female Reproductive Functions. (La tiroxina e la vitamina C in rapporto alle funzioni riproduttive femminili.)

By U. Bracale. Arch. Ostet. Ginec., 52, 17-49,

Jan.-Feb., 1947. 7 figs., 88 refs.

The influence of daily intravenous injections of thyroxine on 8 pregnant rabbits was studied. Two rabbits were used as controls; I non-pregnant rabbit was treated with thyroxine, the other, which was pregnant, had no treatment. A second group of 8 pregnant rabbits were injected with alternate doses of thyroxine and vitamin C (high doses), and the evolution of pregnancy was studied. The average weight of each animal was under 3,000 g. During the experiments the general condition, temperature, weight, pregnancy, and modification of the external genitals were carefully checked.

Crystalline thyroxine was used in a solution containing 0.1 mg. of thyroxine per ml. and a dose of 15 mg. per day per 100 g. weight was given. In all these animals loss of weight, loss of hair, and restlessness were observed. Pregnancy was systematically interrupted before term. The experiment lasted for periods ranging from 9 to 20 days. Three of the animals miscarried. Laparotomy was performed on the other 5 after a loss of blood from the external genitals had occurred; dead foetuses were extracted.

The first control rabbit, non-pregnant, was treated for 15 days with the same dose of thyroxine. No treatment was given to the other control animal, which was killed in the third week of pregnancy; there were 8 actively moving embryos in the uterine cornua.

The 8 rabbits of the second group received the same dose of thyroxine together with 0.5 g. of ascorbic acid by intravenous injection daily. In these there were slight loss of weight, restlessness, and rise in temperature at the beginning, with subsequent normal progress. The treatment continued for periods ranging from 14 to 24 days. Pregnancy reached term in 7 animals with delivery of living young; in the eighth there was premature birth, but living animals were delivered.

Histological investigation of the genital apparatus and of some endocrine glands was performed on all

the subjects. From the histological study of the first group it would appear that the thyrotoxic condition alters cellular metabolism and induces trophic vascular alteration of the uterus and decidua and haemorrhage at the placental site. Hyperfunction of the thyroid and hypofunction of the pituitary with severe damage to the pregnancy are invariable. The inhibitory influence of thyroxine on the corpus luteum caused hypofunction and severe damage to structure (this anatomical-functional alteration of the corpus luteum must be considered the principal cause of the interruption of pregnancy). In the second group the association of thyroxine with large doses of ascorbic acid led to neutralization of thyroxine activity by virtue of the antagonism of vitamin C to thyroxine. The histological examination of the second group showed absence of the changes reported in the first experiment. In the rabbits treated with thyroxine and vitamin C the author was able to demonstrate that ascorbic acid was present in great amount in the cytoplasm of histologically active lutein cells. He is of the opinion that vitamin C is particularly important in the regulation of the functional activity of the corpus luteum.

Rina Saunders

7. Influence of Menstruation and Geophysical Occurrences on the Frequency of Epileptic Attacks. (Die Beeinflussung der Häufigkeitepileptischer Anfälle durch Menstruation und geophysikalische Vorgänge I. Jahresverlauf der Häufigkeitszahlen, Einfluss der Mondphasen und der Menstruation.)

By R. KLIMMER. Disch. Gesundh Wes., 2, 95-97,

Feb. 1, 1947. 1 fig., 5 refs.

The epileptic attacks of 512 patients during 1935 and 1936 were analyzed. The incidence was found to be higher during the winter months, but remained uninfluenced by the lunar phases. The ovarian cycle, on the other hand, was shown to exert a decisive influence on the frequency and severity of epileptic attacks. At the beginning of the proliferating stage, at a time when the production of follicle-stimulating hormone is relatively low, severe attacks were commonest. During ovulation (fourteenth to sixteenth day) and the further increase in oestrin production, all forms of attacks were rare. At the end of the secretory phase with the regression of the corpus luteum, few severe attacks, a maximum of slight attacks, and giddiness were noted. All forms of attacks increased during menstruation. From this it would appear that oestrogen therapy might be indicated during the severe post-menstrual attacks and even perhaps later in the cycle. Cases are cited in which there was evidence of endocrine dysfunction in addition to epilepsy and which responded extremely well to hormone therapy.

[Recent work by Markee et al. may throw additional light on this subject by its explanation of the oestrogen-adrenaline interrelationship, resulting

in occurrence of vascular spasm in the postmenstrual stage and vasodilatation at the time of menstruation.]

H. Jaslowitz

8. Plasma Levels and Urinary Excretion of Ascorbic Acid in Women During the Menstrual Cycle.

By H. M. HAUCK. J. Nutrit., 33, 511-515, May 1947. 7 refs.

Previous reports on variations in the urinary excretion of ascorbic acid and in fasting values of ascorbic acid in plasma in relation to the menstrual cycle are not in agreement. In the present investigation 10 women were studied during 1 or more periods of from 4 to 6 weeks, that is, enough to include r menstrual cycle. In all, data were available for 30 menstrual periods. In 10 cases, 2 menstrual periods occurred in the course of an experiment so that the urinary excretion and the plasma ascorbic acid values could be noted for the midpoint of the cycle. Details of experimental procedure and diet are reported elsewhere. experiments began with a period of high intake of ascorbic acid to ensure saturation. When a menstrual period occurred at the beginning or end of an experiment values for those days during the pre-saturation or re-saturation periods were not included; hence, all values considered were for days or periods on a constant level of intake.

The following data are summarized in respect of each subject: (1) Level of intake in mg. (2) Week of experiment in which menstrual period started. (3) Ascorbic acid in urine in mg.: (a) mean, with standard deviation, for experimental period; (b) value for day before menstrual period; (c) value for first day of menstrual period; (d) mean for menstrual period; (e) value for midpoint of menstrual cycle; (f) week of experimental period in which midpoint of menstrual cycle occurred. (4) Plasma ascorbic acid values in mg. per 100 ml.: (a) mean, with standard deviation, for experimental period; (b) value for midpoint of menstrual cycle.

After the preliminary saturation there was a drop in urinary excretion and plasma acid value during the experimental period. The findings show few marked variations from the mean urinary excretion value, whether for the day before a menstrual period, for the first day of a menstrual period, for the entire menstrual period, or for the midpoint of the menstrual cycle. Further, most instances in which the values related to the menstrual period differed from the mean by more than the standard deviation occurred towards the beginning or end of the experiment, and the differences might be accounted for by the downward trend. Variations noted were not consistently in one direction. Equally great variations have been noted in excretion values for male subjects in the same laboratory. Of ten plasma ascorbic acid values obtained at the midpoint of the menstrual cycle for 8 women, only I differed from the mean for the

experiment by more than the standard deviation. In no case was there an unusual ascorbic acid excretion at the midpoint of the menstrual cycle.

Thus no evidence was found of unusual variability in either urinary excretion of ascorbic acid or fasting plasma ascorbic acid value associated with the menstrual cycle.

Joseph Parness

The Laws of the Menstrual Cycle. (Gesetzmüssigkeiten im Menstruationszyklus der Fran.)

By H. Hosemann. Z. Geburtsh. Gynäk., 128, 170-185, June 1947. 17 figs.

10. Methods of Menstrual Protection and Absorption. (Métodos de proteção e absorção de fluxo menstrual.)

By A. DE AQUINO SALLES. An. brasil. Ginec., 12, 37-51, July 1947. 4 figs.

11. Physiology and Pathogenesis of Functional Uterine Haemorrhage. (Physio-pathogénie des hémorragies fonctionnelles.)

By R. SIMARD. Union méd. Canada, 76, 1054-1055, Sept. 1947.

12. Functional Uterine Haemorrhage. (Hemorragia uterine functional.)

By G. Salgado. An. brasil. Ginec., 12, 1-36, July 1947. 3 figs., 58 refs.

13. Use of Mack's Test in the Study of Ovarian Functions. (Sobre la utilidad del test de Mack en el estudio de la función ovárica.)

By J. AVINO. Rev. esp. Fisiol., 3, 197-202, June 1947. 6 refs.

14. When is Conception Possible? (Wann ist eine Konzeption möglich?)

By E. Rumpf. Zbl. Gynäk., 69, 285-293, 1947. I fig. \*

The optimum time for conception in women with regular menstrual cycles is believed to be between 12 and 15 days before the date of the next expected period. Opinion differs as to whether conception is possible outside these limits and whether the rule holds for shorter or longer cycles.

In order to answer these questions the author investigated 177 women in whom the type of cycle and the date of coitus were precisely known. The author's conclusions suggest that: (1) Conception is possible at any time in the cycle from the sixth to seventh day following menstruation. (2) The shorter the cycle the shorter the duration of pregnancy; the longer the cycle the longer the duration of pregnancy. (3) The sex of the child is not influenced by the stage of the conception. (4) Whether the rule of the "optimum time" holds good for longer or shorter cycles is not made clear by this investigation.

The summarized results are as follows. Average duration of pregnancy in women with a 27- to 29-day cycle: post menstruation, 280.6 days; post

coitus 265.7 days; in women with a 24- to 26-day cycle: post menstruation, 275.6 days; post coitus, 264.3 days. Conception occurred on the average: with a 27- to 29-day cycle after 14.5 days; with a 24- to 26-day cycle after 12.5 days; and with a cycle of more than 30 days after 19.5 days.

E. D. Y. Grasby

15. Studies on the Functions of the Hypophysealdiencephalic System and of the Ovaries by means of Radioactive Phosphorus, [In English.]

By U. Borell, A. Westman, and A. Orstrom. Gynaecologia, Basel, 123, 186-200, Mar. 1947. 2

figs., 14 refs.

These studies are based on the results of experiments upon anoestral and oestral female rabbits injected at predetermined intervals before and after coitus and upon castrates 3 to 5 weeks after oöphorectomy. Each animal received approximately 0.1 millicurie of radioactive phosphorus, P32, as free phosphate in 1 ml. 5 per cent glucose solution intravenously. Animals were killed by decapitation 30 minutes after the injection of radioactive phosphorus. Analyses were carried out on blood, cerebellum, tuber cinereum, anterior lobe of the pituitary, and ovaries. Total radioactivity was expressed in impulses perminute and total phosphate in µg. Hevesy (Ann. Rev. Biochem, 1940, 9, 641.) showed that radioactive phosphorus behaves metabolically in the same way as phosphorus. Thus, the metabolic activity is proportional to the percentage of radioactive phosphorus. The cerebellum was chosen as a standard, and the relative specific activity in the other organs was determined. The experimental results, with statistical analysis, are set out in four tables and two figures. The experiments show the striking influence of coitus upon the tuber cinereum and the anterior lobe of the pituitary, while the effect upon the ovaries is delayed and reaches a second peak at ovulation. The method provides obvious advantages over the previously employed procedures of section and extirpation.

Magnus Haines

16. Effect of the Amount of Protein in the Ration on the Oestrus Cycle in the Adult Rat. Disturbance of the Cycle with Prolonged Oestrus due to an Increase of Protein in the Diet. (Influence du taux' des protides de la ration sur le cycle æstral de la rate adulte. Perturbation du cycle avec prolongation des æstrus sous l'action d'un régime hyperprotidique.)

By P. ASCHKENASY-LELU and A. ASCHKENASY. C.R. Soc. Biol., Paris, 141, 687-689, July 5, 1947.

17. The Early Effects of X-rays on the Ovaries of the Rat.

By L. HALBERSTAEDTER and M. Ickowicz. Radiology, 48, 369–373, Apr. 1947. 6 figs., 9 refs.

The authors have set out to determine whether changes can be demonstrated in the ovary of the rat as early as 4 hours after irradiation by X-rays.

Doses varying from 50 to 2,000 roentgen units were used, on some rats to the abdomen only, on others to the head and thorax only, while others were totally irradiated. There were 4 non-irradiated controls. Serial sections of the ovaries were examined, the animal in each case having been killed 4 hours after irradiation.

In the follicles of the non-irradiated ovaries some pyknosis of the granular layer cells can usually be seen, but this is confined to follicles in which the ovum is in a state of division with the nucleus showing mitosis. Those with resting ova show very few pyknotic cells. In the irradiated series no difference was noted in the rats receiving 50 to 200 roentgen units. After a dose of 400 units and more, however, numerous pyknotic cells were observed in all follicles, both among the follicular cells and those in the granular layer. This appears to happen irrespective of the state of the ova. These findings applied only to the animals receiving direct abdominal irradiation or total irradiation. No abnormality was noted where the abdomen had been protected and the thorax only irradiated. Degenerative changes in the ovaries as early as 4 hours after irradiation, with doses exceeding 400 roentgen units, are thus demonstrated. Photomicrographs are given.

A. M. Rackow

18. Variations in Blood Calcium due to Androgens and Oestrogens. (Les variations de la calcémie par les androgènes et les œstrogènes.)

By H. P. KLOTZ and P. BARBIER, Ann. Endo-

crinol., 8, 57-61, 1947. 21 refs.

The present position of the authors' researches into the effect of a single injection of androgen or oestrogen on the blood calcium in human subjects is briefly described. A single injection of an ester of testosterone (20 mg.) produces in both sexes a rise in blood calcium, beginning within 2 hours and occurring even in parathyroidectomized subjects. Phosphate excretion in the urine was not increased nor was the mineral phosphate content of the blood lowered. This action of testosterone is in every way comparable to that of its chemical analogue, calciferol.

The authors also recapitulate their work, previously reported, on the effect of a single dose of 20 mg. oestradiol benzoate. This produced a lowering of blood calcium in the subjects of latent tetany of both sexes, and particularly in parathyroid-ectomized subjects, but was without effect in this respect on normal persons.

S. S. B. Gilder

19. Physiological and Immunochemical Reaction of Antigonadotrophic Sera. (Activité physiologique et immunochimique des sérums antigonadotropes.)

By A. Bussard and P. Grabar. Bull. Soc. Chim. biol., 29, 195–211, Jan.-Mar. 1947. 27 refs.

Rabbits were injected 4 consecutive days a week for 4 weeks with increasing doses of gonadotrophic hormone of varying purity; they were rested the remaining 3 days, and were bled by cardiac puncture at the end of the fourth week of immunization. The antigens used were either gonadotrophin solutions injected subcutaneously or preparations adsorbed on alumina injected intravenously. Sera obtained from these rabbits were tested in vivo and in vitro for their capacity to react with chorionic gonadotrophin, either when fresh or when adsorbed with human scrum or human urinary proteins. In vivo tests were carried out by the injection of four doses of chorionic gonadotrophin into immature female rats at 24-hour intervals, each injection being preceded by the subcutaneous injection of the test serum. At 120 hours the rats (weighing not more than 55 g. at the end of the experiment) were killed and examined for: (1) opening of the vagina; (2) presence of haemorrhagic ovarian follicles; (3) ovarian weight per g. body weight; and (4) uterine weight per g. body weight. By all these tests the showed considerable antigonadotrophic activity even after absorption with human serum. If gonadotrophin and rabbit antiserum were mixed before injection, antigonadotrophic appeared lower than when the components were injected separately.

Antigonadotrophic sera precipitate readily on mixture with gonadotrophin, and the values so obtained agree fairly well with the *in vivo* values, even after precipitation with human serum. The amount of nitrogen precipitated is, however, far less than the amount of gonadotrophin neutralized would lead one to expect, suggesting (as is confirmed by other evidence) that the gonadotrophins used are extremely impure. Antigonadotrophic sera also give precipitates with some samples of pregnancy urine, though not with citrated urine. Pregnancy urine purified by treatment with saturated benzoic acid in acetone and subsequent concentration always gave a precipitate with antigonadotrophic sera (one control urine also gave a precipitate).

If antigonadotrophic sera and "pregnyl" (a gonadotrophin preparation) commercial allowed to react, the washed centrifuged precipitate shows some gonadotrophic activity. The supernatant precipitated with both pregnyl and antigonadotrophic sera, suggesting that pregnyl contains more than one antigen. Treatment of the supernatant with o.r N sodium hydroxide had little effect on its gonadotrophic activity, while that of the precipitate was completely destroyed. Fractions treated with NaOH showed a correlation between the effects on vaginal opening and ovarian weight, but no correlation between these and uterine weight, supporting the view that impure chorionic gonadotrophin preparations contain more than one active substance.

20. Cytochemical Effects of Oestradiol.

By R. JEENER. Nature, Lond., 159, 578, Apr. 26,

1947. I fig., 9 refs.

Twenty-four hours after the injection of 10 mg. of oestradiol into a mouse, ovariectomized 1 month previously, the proliferating cells of the vaginal wall exhibit a considerable increase in alkaline phosphatase in their cytoplasm (Gomori's technique). This histological demonstration was confirmed by determination of phosphatase activity in vaginal extracts. The increased alkalinephosphatase activity is accompanied by a marked increase in cytoplasmic ribonucleic acid, as shown by Brachet's method and confirmed by estimations according to Schneider's technique. A corresponding increase in alkaline-phosphatase activity occurs also in the uterus, principally in the circular muscle layer. Here also there is an increased concentration of ribonucleic acid. These observations support the view that an increase in alkalinephosphatase activity is associated with synthesis of fibrous proteins. Keratinization is rapidly induced in the vaginal wall by oestradiol, and preliminary data lead to the assumption that myosin synthesis occurs in the uterus under the same conditions. Attention is directed to the similarity of the action of oestradiol on vaginal and uterine phosphatase and that of androgens on the . prostate.

R. J. Ludford

#### PREGNANCY

21. The Influence of Various Diuretics on the Urinary Sodium of Normal Pregnant Women.

By W. E. Brown and J. T. Bradbury. J. Lab.

clin. Med., 32, 312-313, Mar. 1947.

In pregnant women on a diet with constant sodium level administration of mercurial diuretics, ammonium chloride, aminophylline, or water (6 litres daily) increases daily sodium output. Administration of 25 to 50 per cent glucose solution decreases it. Sodium concentration is greatest with the mercury compound and least with the water.

V. I. Woolley

22. Importance of Serum Cholinesterase in Physiology and Clinical Medicine with special reference to Obstetrics and Gynaecology. (L'importanza della colinesterasi serica nella fisiologia e nella clinica con particolare riguardo al campo ostetrico-ginecologico.)

By R. Piccoli and G. Longo. Arch. Ostet. Ginec., 42, 168-184, May-June 1947. 13 refs.

23. Experimental Foetal Death in the Rat: Histological Changes in the Membranes.

By J. J. PRITCHARD and A. ST. G. HUGGETT. J. Anat., Lond., 81 212-224, July 1947. 21 figs., 25 refs.

24. Pulmonary Function in Pregnancy. (Uber die Lungenfunktion in der Schwangerschaft.)

By H. C. LANDEN. Z. Geburts. Gynäk., 127, 310-315, Jan. 1947. 25 refs.

25. Liver Blood Flow in Pregnancy-Hepatic Vein Catheterization.

By E. W. Munnell and H. C. Taylor. J. clin., Invest., 26, 952-956, Sept. 1947. 4 refs.

26. Is the Lower Limit Recognized by Law for Length of Pregnancy Justified? (Besteht die untere Grenze der gesetzlichen Empfängniszeit zu Recht?)

By E. Guenther. Z. Geburts. Gynäk., 127, 258-266, Jan. 1947. 1 fig., 5 refs.

27. Some Recent Advances in Foetal Physiology. By S. G. CLAYTON. Post-Grad. med. J., 23, 474-481, Oct. 1947. 3 figs., 54 refs.

28. Placental Metabolism of Vitamin C. II. Histochemical Analysis.

By J. H. HOLZAEPFEL and A. C. BARNES. Amer. J. Obstet. Gynec., 53, 864-868, May 1947. 2 figs., 11 refs.

The authors describe a method of staining the ascorbic acid present in the placenta. They show that the syncytial cells contain the greater amount though there is some precipitation of silver salts by the vitamin in the stroma. No difference was noted in the depth of staining in rabbit placentae in which pregnancy had been terminated at 30 and 60 days.

Braithwaite Rickford

29. The Amniotic Duct as the Key Structure in the Determination of the Direction of Growth of the Human Placenta and its Orientation in the Uterus.

By J. Krafka and L. Bowles. Amer. J. Obstet. Gynec., 53, 561-568, Apr. 1947. 11 figs., 11 refs.

It has been generally held that the placenta grows radially from a fixed centre. Examination of the vascular bed of the placenta has shown, however, that it is bilaterally symmetrical, with the right and left umbilical arteries distributed according to a definite basic pattern consisting of an anterior, lateral, and posterior branch on either side. Right and left sides are recognized by the relation to the umbilical vein, which always lies anterior to the cross anastomosis between the two arteries. This relation can be demonstrated in the vessels of the 3-mm. embryo at the time when the vascular bed is first established. In the 13-day Torpin ovum the amniotic duct consists of a solid cord of cells in continuity with Langhans' layer of the chorion above, and canalized at its lower end, the lumen. opening into the amniotic cavity. It is reminiscent of the strand of cells left along the raphe in those species where the amnion is formed by fusion over the embryonic shield. The amnion is formed by a rearrangement of cells of the embryonic knob around a central cavity. The cells of the knob are in continuity with the chorionic ectoderm at this

point, and as these cells are the erosive cells they mark the point of implantation of the ovum in the endometrium. Thus the outer end of the potential amniotic duct underlies the implantation site. In man the allantoic duct makes its appearance at 14 days, and therefore later than the amniotic duct. It extends into the body stalk, and at 21 days reaches as far forwards as the amniotic duct. There is marked undercutting of the body stalk from the chorial plate back to the region of the outer end of the amniotic duct, and this now becomes the outer bed of the potential umbilical cord. This point becomes still further fixed as the vascular bed is established. The authors have been able to identify the cross-anastomosis between the two umbilical arteries in a 3-mm. embryo. This anastomosis fixes the outer end of the body stalk as it becomes the core of the umbilical cord. Hence the placental insertion of the cord marks the normal implantation site.

In most of the grossly bilobate placentas the umbilical cord insertion falls on the line dividing the placenta into two halves. Bilobation is the result of the adaptation of the growing villi to the maternal vascular bed, and is not, as has been commonly held, due to extension of growth over the sulci between the anterior and posterior surfaces of the endometrium. From practically any point of implantation, growth of the placenta may be transverse, toward the cervix, or toward the fundus. The most frequent site of implantation is the midline of the fundal zone. Data are given from the Torpin collection consisting of 1,087 specimens. Of these 588 were implanted in the middle of the fundus; 36 were in the right corner and 23 in the left, 5 cervical and 3 cervico-lateral.

F. J. Browne

30. Nourishment and Foetal Development. (Ernührung und fötale Entwicklung.)

By H. Hosemann. Dtsch. med. Wschr., 72, 507-511, Sept. 19, 1947.

31. Colorimetric Estimation of Urinary Steroids and Study of Lutein Function. Clinical Application especially to the Diagnosis of Pregnancy. (Sur le dosage colorimétrique des stéroides urinaires et l'exploration de la fonction lutéinique. Essais d'application clinique en particulier au diagnostic de la gestation.)

By M. F. JAYLE, M. LACOMME, and O. LIBERT. Gynéc. Obstét., 45, 783-790, 1946. 2 refs.

Using the methods of Jayle et al. (Bull. Soc. Chim. biol., 1946, 28, 363, 373) the authors have estimated the total steroid (non-phenolic) and pregnanediol content of urine specimens from women complaining of amenorrhoea from a variety of causes (including pregnancy). They claim that the method is less difficult than that of Venning and Browne and, in contrast to that of Guterman (another colorimetric method), it is quantitative and in 55 out of 62 cases permitted differentiation

between a corpus luteum of pregnaucy and that of menstruation.

[Pregnanciol estimations cannot be used as a diagnostic aid so long as levels presumed to be diagnostic are found in unexpected cases. It may not be the method that is at fault.]

Magnus Haines

32. Early Diagnosis of Pregnancy. (Diagnostic précoce de la gestation.)

By M. F. Lepage. Sem. Hôp., Paris, 23, 2186-2188, Sept. 28, 1947.

33. General Observations on Xenopus laevis Used in Tests for Pregnancy. (Generalidades sobre a "Xenopus Laevis", animal reativo para o diagnóstico precoce da gravidez.)

By M. I. Mello. *Hospital, Rio de J.*, 32, 327–334, Sept. 1947. 5 figs., 11 refs.

34. Hormone Diagnosis of Pregnancy with Xenopus Lacvis. (Die hormonale Schwangerschaftsdiagnose mit dem Krallenfrosch.)

By W. BICKENBACH. Zbl. Gynäk., 69, 32-38, 1947. 6 figs., 18 refs.

35. Radiological Examination at the End of Pregnancy. (Exploración radiológica en embarazo a término.)

By A. Montano. Rev. mex. Cir. Ginec. Cancer, 15, 229-232, June 1947.

36. Serology and Obstetrics.

By T. LA VAKE. Amer. J. Obstet. Gynec., 53,

459–466, Mar. 1947.

The theory is put forward that toxaemia of pregnancy may be due to toxins resulting from incompatibility between maternal and foetal blood. The author holds the view that incompatible transfused blood is poisonous to the cells of the recipient, and that if the obscuring effects of agglutination and haemolysis could be obviated changes would be found in the recipient similar to those seen in toxaemia of pregnancy. Inherited agglutinins, he argues, represent inherited antitoxic substances which afford a modicum of protection to the female who may bear a foetus containing blood substances toxic to the type of cells she possesses. If the antitoxic substance involved is not sufficient to protect the mother and if her cells are vigorous, they will secrete more of the same antitoxic substance and the titre of the isoagglutinin may rise. The true strength of the antitoxin may, however, be masked by the antitoxinabsorptive power of the foetal cells and antigens in solution. He discusses the reason why the human being possesses hereditary antitoxins against some substances only, and suggests that substances against which no inherited antitoxins are found may have entered the species too recently to be inheritable yet. The Rh group is quoted as anexample, and it is stated that about 30 per cent of cases of clinical crythroblastosis are associated with pregnancy toxaemia. The author found that A and B substances could bring about the same phenomena. He is now seeking specific antitoxic sera in order to treat the mother after either intrapartum death of the child or postpartum eclampsia.

Three cases are described. Mothers were of Group O, Rh-positive, while fathers and children were of group A, Rh-positive. In the first case anti-A titre was 1 in 1,000 at the thirty-fourth week, when there was mild toxaemia and an accidental haemorrhage. Delivery of a living child at term was uneventful and the anti-A titre rose to 1 in 2,000 five days later.

In the author's second case the patient developed toxaemia and an anti-A titre of I in I,000. A dead foetus was delivered at 28 weeks and the titre rose to I in I00,000 in 5 days. The third patient had had 2 erythroblastotic infants and had an anti-A titre of I in 8,000 but no toxaemia. After delivery of an erythroblastotic child, which survived after transfusion, the titre increased to I in 8,000,000.

[There is much theorising on rather insecure foundation in this paper. Several other authors reporting large series of cases have been unable to correlate iso-immunization with toxaemia of pregnancy.]

Dorcen Daley

37. The Possible Etiologic Significance of Thrombosis of a Placental Vein on the Mechanism of Placental Infarction and Associated Toxemia of Pregnancy.

By R. A. BARTHOLOMEW. Amer. J. Obstet. Gynec., 53, 650-657, Apr. 1947. 5 figs., 17 refs.

The author cites a case in which there was antepartum haemorrhage due to low implantation of the placenta, followed by mild toxacmia, in which he found a thrombosed vein on the foetal surface of the placenta. Thrombosis in the vein caused, he believes, engorgement of the foetal vessels in the chorionic villi, and consequent rupture of the vessels and formation of a placental infarct. From such infarcts poisonous products of protein fission are absorbed into the maternal circulation and give rise to widespread damage to maternal tissues, especially liver and kidneys, toxaemia, and, in the worst cases, eclamptic convulsions. In support of this view he points out that infarcts correspond to a placental cotyledon, and that while visible thrombosis of a vein on the foetal surface of the placenta is rare thrombosis of veins in the infarcted villi can always be demonstrated in placental infarcts. Thus, while accepting Young's well-known views about the relation between placental infarcts and eclampsia he disagrees with Young's view that the infarction arises from interference with maternal circulation to the placenta. Apparently the author has now discarded the view advanced in previous papers that the infarction of the vessels

running in the chorion on the foetal surface of the placenta is caused by trauma by foetal movements, or, alternatively, that it is due to cholesterol laid down in the walls of the foetal arteries in the villi. In cases in which no visible thrombosis is present in the surface veins of the placenta he supposes that there is, perhaps through the action of some circulating hormone passing from the maternal to the foetal blood, a contraction of the sphincters of the foetal collecting veins causing "distention of the terminal villous veins and arteries and stagnation of the circulation in the dependent villi, followed by rupture and necrosis".

F. J. Browne

38. A Study of the Inter-action of Pregnancy and Hypertensive Disease.

By L. C. CHESLEY, J. E. ANNITTO, and D. G. JARVIS. Amer. J. Obstet. Gynec., 53, 851-863,

May 1947. 1 fig., 13 refs.

The authors have studied 218 patients in 301 "hypertensive pregnancies complicated by disease", the average length of follow up being 7 years. The criterion of hypertension was a blood pressure of 140/90 mm. Hg or more occurring before the twenty-fourth week, excluding that found on the first examination. Super-added toxaemia occurred in 30 per cent of the pregnancies; eclainpsia was ten times more common and toxaemia seven times more so than was to be expected. The maternal death rate (including patients who died up to 4 months after delivery) was 4.3 per cent, while the gross foetal loss was 38.2 per cent.

[This is an important paper and deserves careful study. The practical points which are well brought out are: (a) That simple hypertension without a renal or malignant basis is not a serious complication of pregnancy, unless a toxaemic albuminuria is added. (b) Albuminuria is likely in 1 out of 3 such cases, and if this should occur, pregnancy should, as a general rule, be terminated at once. (c) All such patients should therefore be seen on frequent

occasions throughout pregnancy.

Braithwaite Rickford

39. Pregnancy in the Patient with Hypertensive Disease.

By L. C. Chesley and J. E. Annitto. Amer. J. Obstet. Gynec., 53, 372-381, Mar. 1947. 8 refs.

This paper deals with the findings in a series of women in whom recorded blood pressures before the twenty-fourth week of gestation permit the diagnosis of "hypertensive toxaemia". The standard for hypertension is a blood pressure of 140/90 mm. Hg or higher. There were 301 pregnancies in 218 women reviewed.

That pregnancy is dangerous in such cases is shown by the fact that "the total maternal mortality was twenty times that for the whole hospital experience, the foetal loss was increased nearly tenfold, and the incidence of toxaemia was multiplied by seven". Of 13 deaths 8 were probably associated with hypertension and 5 were attributable to intercurrent disease. Two-thirds of the patients escaped superimposed toxacmia. In these there were two late puerperal deaths, one of intercurrent causation. The foetal loss was 18.5 per cent. Of those patients with added toxaemia, 6 died (6.67 per cent) immediately after delivery, and 5 died late in the puerperium, giving a total maternal mortality of 12.2 per cent. The foetal loss was 50 per cent. Nearly 40 per cent of the hypertensive patients showed a fall in the blood pressure in mid-pregnancy. In such cases the restoration of the blood-pressure level in the later months may lead to a diagnosis of pre-eclampsia if the initial blood pressure is unknown. Renal function was normal in 93 per cent of the pregnancies. Premature separation of the placenta occurred in 5.6 per cent.

[The results of this work are noteworthy, the more so because the authors have not carried out therapeutic abortion in the more severely hyper-

tensive patients.]

G. Gordon Lennon

40. The "Cold Test" in Toxaemias of Pregnancy. (Der Kalt-test (C.T.) nach Hines und Brown bei den Gestosen.)

By R. Joнow. Z. Geburtsh. Gynäk., 128, 5-13,

Mar. 1947. 8 refs.

Hines and Brown hoped that their "cold test" in pregnancy would help to identify women with a tendency to hypertension and thereby anticipate the development of the toxaemias in them. The test depends on measuring changes in the blood pressure taken every half-minute after the hand has been immersed in ice water (4°C.) for exactly 2 minutes. The author examined 150 women in a further study of the test in normal and abnormal pregnancy, and in a small group of non-pregnant women. From this careful investigation he confirms the generally held view that such variations in the blood pressure are usually transient and not sufficiently significant to identify early hypertensive cases of potentially toxaemic cases; women who had previously passed through an eclamptic or pre-eclamptic pregnancy showed no statistically greater variations in the early stages of a subsequent pregnancy.

E. D. Y. Grasby

41. Pre-eclampsia. (La prééclampsie.)
By G. Anciaux. *Brux. méd.*, **27**, 2221-2224, Oct. 12, 1947.

42. Toxic Complications of Pregnancy in Gorgas Hospital, Panama Canal Zone, 1931-45. An Analysis of 10,000 Pregnancies.

By N. S. Scrimshaw. *Amer. J. Obstet. Gynec.*, 54, 428-444, Sept. 1947. 2 figs., 74 refs.

43. Toxaemias of Pregnancy. (Toxemias del embarazo.)

By F. L. Adair. Rev. méd. Cordoba, 35, 378-391, July 1947.

44. Radiographic Diagnosis in Cases of Placenta Praevia. (Diagnostic radiographique dans les cas de placenta praevia.)

By R. STRAETMANS and G. GEERAERT. Brux.

méd., 27, 981-990, May 4, 1947. 6 figs.

The authors discuss the role of the cystogram (antero-posterior and lateral) in the diagnosis of placenta praevia. Their method is to fill but not distend the bladder with 40 ml. of a 50 per cent solution of a thorium salt ("umbrathor"). Radiographs have been taken in normal primiparae and multiparae in the last three months of pregnancy with or without engagement of the head, and the authors assert that in all these cases there is coaptation between the head or pelvis of the foetus and the bladder opacity. In cases of placenta praevia in the last trimester a space of at least I to 2 cm. is seen between the presenting part and the bladder. The space is less well marked if the placenta is postero-lateral or posterior-marginal, but is still present at one or other side. The method is valueless if the lie is transverse. Lateral radiographs have added nothing of value to the interpretation of the result.

[The abstracter regards the cystogram test as valuable when positive, but coaptation between presenting part and bladder shadow does not exclude the presence of a placenta praevia.]

G. Gordon Lennon

45. The Rh Factor in Abortion.

By A. B. Hunt. Amer. J. Obstet. Gynec., 53,

467-473, Mar. 1947. 9 refs.

The incidence of single spontaneous abortions does not seem to be influenced by the presence or absence of the Rh factor. The incidence of stillbirth and neonatal deaths, however, is higher among Rh-negative women than among Rhpositive. The number of women in a group of 93, with a history of recurrent abortion, whose blood did not contain the Rh factor, was somewhat higher than would be the case in the general population [18.3 per cent in this series]. There seems to be no striking increase in the frequency of abortion or miscarriage after the occurrence of erythroblastosis foetalis [11.5 per cent miscarriage rate after erythroblastosis quoted from a series by Race et al. Numbers are insufficient to be conclusive in the author's series.] On the other hand, there is a striking increase in the casualties of late pregnancy among Rh-negative women. [4.5 per cent stillbirths compared with 0.9 per cent]. Data concerning a small series of 25 women who gave birth to a normal child and then began to have abortions and miscarriages are analyzed; 23 Rhnegative women had more than one unproductive pregnancy compared with only 2 who were Rhpositive. In this series there were fewer Rhnegative women than are found, comparatively

speaking, in the general population.

The Rh factor has possibly been over-emphasized as a cause of abortion and miscarriage at the expense of more common causes—such as dysfunction of the ovaries, pituitary, thyroid, and, possibly, the testes of the husband. An Rh-negative woman subject to habitual abortion may be permitted to attempt another pregnancy in the more nearly ideal physiological environment that proper therapy may provide.

Dorcen Daley

46. Abortions Treated Conservatively. A 12-year Study Covering 3,739 Cases.

By P. B. Russell. Sth. med. J., 40, 314-324,

Apr. 1947. 5 refs.

The purpose of this paper is to discuss the conservative treatment of inevitable abortion and to give statistics of results obtained by conservative treatment over a 12-year period. During this period there were 3,739 cases of abortion treated. Criminal abortions made up 9 per cent of the total; the

methods used are given.

The author states that retained placenta in abortion is most often due to a contraction ring, and this is caused by an acidotic condition of the patient. Oxytocics act without difficulty when there is no ring. The principle of treatment was to give I ml. of "pitocin" every hour for three or more doses, followed by ergot by mouth, and the author states that there were only 35 failures in 2,406 incomplete abortions. The operation rate for the whole series was 5.4 per cent (202 patients) and in most cases the operation was dilatation and curettage with packing. The over-all mortality was 13 per cent.

The author stresses the fact that conservative treatment for abortion is the treatment of choice.

L. W. Lauste

47. Haemorrhage in Pregnancy not due to Threatened Abortion. (Les hémorragies de la grossesse qui ne sont pas des menaces d'avortement.)

By H. Sanche. Union méd. Canada, 76, 1057-

1061, Sept. 1947.

48. The Abortion Problem in Sweden.

By G. Inghe. *Human Fertil.*, 12, 40-45, June 1947.

49. Some Medico-legal and Social Aspects of Abortion. (Algunas consideraciones medico-legales y sociales del aborto.)

By F. A. HERNANDEZ. *Medicina, Bogota,* **9**, 149–162, July-Aug. 1947. 9 refs.

50. Foreign Body Introduced into the Abdomen through the Vagina. An Attempt to Procure Abortion.

By J. B. DAWSON. N.Z. med. J., 46, 316-317, Aug. 1947. 1 fig.

51. Treatment of Febrile Abortion. (Zur Behandlung der fieberhaften Fehlgeburt.)

By A. Rockenschaub. Wien. med. Wschr., 97, 450-451, Oct. 18, 1947. 1 fig., 3 refs.

52. A Case of Pneumoperitoneum due to Infection with Gas Gangrene Organisms after Interruption of Pregnancy. (Uber einen Fall von Pneumoperitoneum, hervorgerufen durch Infektion mit Rauschbrandbazillus nach Schwangerschaftsunterbrechung.)

By A. Kaeding. Z. Geburts. Gynäk., 127, 266-

271, Jan. 1947. 3 figs., 8 refs.

53. Case Reports from the Maternal Welfare Records. Rupture of the Uterus.

By J. S. Brewer, G. M. Cooper, E. W. Frank-Lin, J. S. Hunt, T. L. Lee, I. Procter, R. A. Ross, and R. A. White. *North Carolina med. J.*, 8, 591–593, Sept. 1947. 2 refs.

54. Considerations on Uterine Rupture. (Considerações em torno das ruturas uterinas.)

By O. SANDOVAL DE CARVALHO. Rev. méd. Pernambuco, 17, 103-116, June 1947.

55. Carcinoma of the Cervix Uteri and Pregnancy. II. Considerations on their Reciprocal Influences. (Carcinoma de cuello uterino y embarazo. II. Consideraciones sobre sus reciprocas influencias.)

By V. Notario Garcia and A. Garcia Hernandez. *Med. esp.*, 18, 200–208, Aug. 1947. Bibliography.

56. Carcinoma of the Cervix Uteri and Pregnancy. (Câncer do colo e gravidez.)

By D. RAMOS. Rev. Ginec. Obstet., 2, 628-640, Aug. 1947. 9 figs., 13 refs.

57. Pregnancy and Carcinoma of the Cervix Uteri. (Gravidez e câncer do colo.)

By Jorge de Rezende. Rev. Ginec. Obstet., 2, 583-622, Aug. 1947. 188 refs.

58. Epithelial Keratinization as Evidence of Fetal Vitamin A Deficiency.

By J. G. Wilson and J. Warkany. *Proc. Soc.* exp. Biol., N.Y., 64, 419-422, Apr. 1947. 4 figs., 3 refs.

The cardinal sign of vitamin-A deficiency is the appearance of stratified keratinized epithelium in an unusual site. The authors of this article describe such "keratinizing metaplasia" in sections of the genito-urinary tract taken from 14 rat foetuses and newborn rats whose mothers were kept on an Adeficient diet throughout pregnancy. Normally keratinization only takes place in the most distal parts of the urethra. Neither the controls nor the experimental animals showed any keratinization before the eighteenth day of gestation, but by the

twentieth day a small area of truly keratinized epithelium was consistently found in the distal two-thirds of the urogenital sinus. More advanced changes were found on the twenty-first and twenty-second days (the latter were newborn rats); these are illustrated by photomicrographs of the urethra of a newborn rat whose mother had received adequate vitamin A and of the offspring of an inadequately fed mother. The latter shows a further degree of cornification and much desquamation at some points, metaplasia being most pronounced on the dorsal aspect of the urogenital sinus and genital ducts.

It is evident from these observations that vitamin A is necessary for the formation of normal genitourinary epithelium in rats, but that a certain degree of differentiation is needed before metaplasia occurs on about the eighteenth day.

T. E. C. Early

59. Radiological Differential Diagnosis of Hydrocephalus. (Zur rontgenologischen Differentialdiagnose des Hydrocephalus.)

By H. SIEVERS. Zbl. Gynäk., 69, 26-31, 1947. 4 figs., 5 refs.

60. Myelosis and Pregnancy. (Myelose und Schwangerschaft.)

By E. E. Reimer. Klin. Med. Wien., 2, 373-382,

Apr. 15, 1947. 1 fig., 25 refs.

In 10 years 85 patients with chronic myeloid leucaemia, of whom 56 were women, were observed in the author's clinic. Four cases were associated with pregnancy. Full clinical and haematological records of these 4 cases are given; all were typical of chronic myeloid leucaemia with anaemia, leucocytosis of 400,000 with 45 per cent myelocytes, and a marked increase in promyelocytes in bone marrow. All were temporarily improved by X-ray therapy, the first patient being alive two years after delivery, though the second and third died within 18 months of severe agranulocytosis.

The fourth patient, aged 26, gave a longer history of illness. In three years the spleen had gradually increased in size; investigation revealed a typical blood picture. X-ray therapy produced marked improvement maintained over a further two years. Examination then revealed a 3-month pregnancy. Rapid deterioration in her condition and increase in leucaemic symptoms-anaemia, enlarging spleen, oedema-followed, and albumin, pus, and epithelial cells appeared in the urine. Pregnancy was terminated at 28 weeks by vaginal hysterotomy and was followed by severe haemorrhage. Shortly afterwards the patient died-postmortem examination showed changes in the mother typical of chronic myeloid leucaemia. The blood in the intervillous spaces of the placenta contained many myeloid cells, but none was found in the villi. The foetal cord blood contained 6,000 leucocytes per c.mm. but no leucaemic cells. Blood from other organs and the bone marrow gave the same picture.

In reviewing the literature and commenting on these cases the author makes the following observations. Chronic lymphatic leucaemia and pregnancy have never been observed together, infiltration of the ovary and uterus preventing ovulation and nidation. Acute myeloblastic leucaemia and pregnancy invariably end in death of the mother (usually from haemorrhage) and foetus; X-ray therapy is of no value. In all cases chronic myeloid leucaemia is made worse by pregnancy and the spleen always enlarges. An acute form may supervene on a chronic during pregnancy. The course of the pregnancy and labour is commonly undisturbed and the infants are unaffected, no leucaemic tendency passing from mother to child.

The author believes that general as well as local X-radiation should be given. The expectation of life is certainly improved by therapy in chronic forms of leucaemia. The bone-marrow smear reproduces the blood picture, and the greater the number of mature granulocytes the better the prognosis: increase in the myelocytes and promyelocytes is of bad prognostic significance. Platelets are numerous in early stages (as high as 800,000) but fall, even below the normal, in well established disease.

E. D. Y. Grasby

61. Clinical and Hematologic Aplastic Anemia with Hypercellular Marrow in Pregnancy.

By E. E. DILWORTH and C. R. MAYS. Amer. J. Obstet. Gynec., 54, 529-532, Sept. 1947. 3 ress.

62. Congenital Aneurysm of the Circle of Willis Associated with Pregnancy.

By E. E. RHOADS. Amer. J. Obstet. Gynec., 54, 533-536, Sept. 1947. 5 refs.

63. The Incidence and Causation of Glycosuria in Pregnancy. Part. I.

By K. C. Batliwalla. Indian med. Gaz., 82,

191-193, Apr. 1947. 5 figs., 11 refs.

Samples of urine from 540 women 3 to 9 months pregnant were tested for glucose, lactose, albumin, indican, and acetone bodies. Lactose was found only in four samples collected a few days before labour. The incidence of glycosuria rose from about 4 per cent in the third month to about 37 per cent in the ninth month, and was greater during subsequent pregnancies. Glycosuria occurred slightly more frequently amongst women on vegetarian and low-calcium diets, and least frequently amongst those on vitamin C-rich diets.

J. E. Page

64. Pathogenesis of Diseases of the Kidneys in Pregnancy. (Pathogénie des néphropathies gravidiques) By H. PIGEAUD and M. DUMONT. Gynéc. Obstét., 46, 454-458, 1947.

65. Urinary Complications in Pregnancy. A Case Report.

By L. H. BISKIND and J. B. GALVIN. *Urol. cutan*. *Rev.*, 51, 495-497, Sept. 1947. 1 fig.

66. Treatment of Pyrosis in Pregnancy by Prostigmin. (Tratamiento de la pirosis del embarazo por prostigmine.)

By J. J. Gomez-Sigler. Clin. y Lab., 44, 198-200, Sept. 1947.

67. Transmission of Poliomyelitis during Pregnancy and Labour. (Die übertragbare Kinderlähmung in der Schwangerschaft und während der Geburt.)

By K. Podleschka. Zbl. Gynäk., 69, 238-255, 1947. 24 refs.

194/. 24 1015.

Anterior poliomyelitis and pregnancy are not commonly seen together. The author describes two cases of poliomyelitis at the end of pregnancy in which the management of delivery presented considerable difficulties.

The first case was that of a healthy young primigravida, aged 20, seen when 7 days overdue, who a week later was suddenly taken ill and 2 days later developed acute anterior poliomyelitis of the ascending Landry type. The prognosis was hopeless, paralysis rapidly increasing with cyanosis. At this time the foetal heart became irregular, and when the mother herself lost consciousness a Caesarean section was performed. The foetus was cyanosed at birth but survived, and the infant was transferred to an Isolation-Hospital. Eleven days later, it also developed acute anterior poliomyelitis with typical Landry ascending paralysis and died 12 hours later.

The second case was that of a 23-year-old primigravida who at full term developed pyrexia and head and back pains, followed 3 days later by typical acute anterior poliomyelitis. This was of the ascending Landry type, and as in the former case a Caesarean section was performed on a moribund patient, who died 2 hours later. The foetus was stillborn, but necropsy revealed no evidence of poliomyelitis. The question of transplacental communication to the first foetus is raised, but this mode of infection cannot be substantiated.

The author gives in considerable detail abstracts from the literature, most of which deal with pregnancy in patients suffering from the late results of poliomyelitis, pregnancy being normal and the children quite unaffected. The incidence of operative deliveries is higher because of the failure of the accessory muscles during labour. One case of Caesarean section in a moribund patient, in which a healthy child was born and known to be alive 15 years later, is recorded.

The author concludes from his own investigations and a review of the literature that pregnancy is not materially influenced by the disease, nor does it influence the disease itself. The foetus is not

infected in utero, but at birth is introduced to a highly infected environment should the mother be suffering from the acute disease. Pregnancy in a woman convalescent or recovered from poliomyelitis will result in inheritance of immunity by the child. Diagnosis and management of poliomyelitis are the same as in a non-pregnant woman. In acute cases in which a fatal outcome is inevitable, Caesarean section is the only means of saving a viable child.

E. D. Y. Grasby

68. Syphilis and Pregnancy. (Sifilis e gravidez.)
By O. Bahia. Rev. Ginec. Obstet., 2, 692-702,
Sept. 1947. 27 refs.

69. Effect of Malaria on Pregnancy.

By D. D. Kulcsar. Canad. med. Ass. J., 57, 332-337, Oct. 1947. 16 refs.

70. Appendicitis Complicating Pregnancy, Labour, and the Puerperium.

By R. L. Meiling. Surg. Gynec. Obstet., 85, 512-522, Oct. 1947. 50 refs.

71. Diagnosis of Ectopic Pregnancy by Hysterosalpingography. [In English.]

By B. Nielsen. Acta radiol., 28, 185-198, Apr.

30, 1947. 8 figs., 6 refs.

After reviewing the scope of hysterosalpingography in ectopic pregnancy and briefly examining the literature on this subject, the author describes a personal investigation of 25 cases of suspected tubal pregnancy with an aqueous contrast medium, "perabrodil", in 35 per cent solution. He emphasizes the need for exposing several films in each case and for watching the penetration of the contrast medium in successive pictures. [He does not specify the quantity of fluid used.] He does not consider that, apart from the changes in the pregnant tube, any characteristic indications of tubal pregnancy exist. A hypotonic uterus is a rare accompaniment and is more suggestive of early intrauterine pregnancy or abortion. In the pregnant tube the appearances are those of: (a) filling defect; (b) incomplete and irregular filling without a definite defect; (c) a tube which fills normally in its juxta-uterine portion but terminates in a sudden semilunar dilatation in the vicinity of the uterus, giving a "mallet-shaped" appearance; (d) complete failure of the medium to penetrate the tube. The author suggests that the main value of the procedure is a negative one, in that tubal pregnancy may be ruled out with certainty if the tubes are normal in appearance and patent. Nevertheless, in the series of cases which he investigated, the correct diagnosis was made by hystersalpingography in 11 out of 12 cases of tubal pregnancy, the twelfth case being reported as one in which tubal pregnancy could not be ruled out. In the non-pregnant patients, a similar equivocal report was made once,

while in the remaining cases alternative diagnoses were suggested. The author experienced no serious complications with his method, but points out that tubal rupture may result from the investigation, which should not be undertaken unless facilities for operation are immediately available. He does not discount the risk of producing abortion of an intrauterine pregnancy, but records 4 cases of early pregnancy in which gestation continued in 3, miscarriage occurring in the fourth after the patient was discharged from hospital [exact time interval between examination and abortion not stated].

W. I. C. Morris

72. Pathogenesis of Tubal Pregnancy in Tubal Tuberculosis. (Zur Pathogenese der Eileiterschwangerschaft bei Eileitertuberkulose.)

By O. PENDL. Klin. Med., Wien., 2, 349-364,

Apr. 15, 1947. 4 figs., 43 refs.

Repeated investigations have shown that the incidence of tuberculosis of the uterus and adnexa, and in particular of the Fallopian tubes, is very much higher than is generally assumed. Ascending or descending infection of the tubes occurs rarely, most cases originating by blood-borne infection from a tuberculous focus elsewhere in the body. Spontaneous healing of a tuberculous tube has been observed, but subsequent sterility is the rule. If, however, the tuberculous process heals without producing an obstructive lesion of the lumen, uterine pregnancy is possible, but the formation of crypts in the mucosa, kinking of the tube, adhesions, and other partial obstructions to the normal progress of the ovum render tubal pregnancies more probable. When pregnancy occurs in a tube it is not known whether the tuberculous disease arises during pregnancy or precedes it, and opinions vary as to whether nidation can take place in a tuberculous endometrium.

The author observed from 36 recorded cases that the majority of tubal pregnancies associated with tuberculous salpingitis occurred in primigravidae, aged 27 to 37 years. In 3 cases it was associated with fatal miliary tuberculosis, in I with meningitis, in 4 with known familial tuberculosis, in 1 with a suspected pulmonary lesion in early youth, and in 2 with tuberculous lesions in other organs. Microscopically the tubes showed recent tuberculosis of the mucosa, and in some cases more extensive involvement of muscle with actual caseation and necrosis. The most striking observation was the complete similarity between the duration of the pregnancy and that of the tuberculous process, which before the second month extended only to the mucosa but after that to the muscularis. In two cases older foci of infection were observed near areas of more recent disease, but the author believes that pregnancy is responsible for the occurrence or recrudescence of active disease in the tube. No case has so far been described

of pregnancy occurring in the presence of established tuberculosis salpingitis.

The author reviews fully the pathological findings in cases already recorded, and then quotes the details of a personal case. A nulliparous woman of 33 years, married 14 years, was operated upon for a ruptured tubal pregnancy. The tube and ovary were removed. In both mucosa and muscularis there was evidence of old tuberculous disease, but in the mucosa there was also recent miliary tuberculosis, especially marked in the region of the ovum. Nidation had occurred in the ampulla, in a deep mucosal crypt near an area of polypoidal proliferation of the mucous membrane. Decidua formation was present around the ovum and in the fimbriae, but only in areas actually free from tuberculous involvement. The author also describes certain so-called "pale cells" in the outer layers of the mucosa; their exact significance is not known.

The author expresses the view that pregnancy occurring in the presence of a tuberculous focus in the body of a patient showing some concomitant constitutional and "allergic" tendency may result in the activation of a tuberculous salpingitis. Pregnancy will be tubal if there is any mechanical obstruction to the normal passage of the ovum. Tuberculous infection, blood-borne from a distant focus, will follow and progress simultaneously with the pregnancy.

[The pathological and microscopical findings are

most carefully described.]

E. D. Y. Grasby

73. Radium in the Treatment of Ectopic Pregnancy. By E. F. Blumberg. Med. Press, 218, 399-401, Oct. 29, 1947.

74. Full term Intra-abdominal Pregnancy with Living Mother and Child.

By H. Sin Teh. Yale J. Biol. Med., 19, 951-953, July 1947. 5 refs.

75. Abdominal Extrauterine Pregnancy. Study of a Case with Special Reference to the Treatment. (Graviditas Extrauterina Abdominalis. Gennemgang af et Tilfaelde med Saerlig Henblik paa Behandlingen.)

By B. ARFMANN. *Ugeshr*. *Læg.*, 39, 580-584, Sept. 25, 1947. I fig., 7 refs.

76. Primary Ovarian Pregnancy: Case Report. By H. E. H. DENHAM. N.Z. med. J., 46, 317-319, Aug. 1947. I fig., 11 refs.

#### LABOUR

77. On a Theory regarding the Cervix in Relation to Labour. (A propos d'une théorie cervicale appliquée a l'accouchement.)

By J. Kreis. Rev. franç. Gynéc., 42, 45-54, Feb. 1947. 6 refs.

The suggestion is advanced that the cervix, being composed of muscle and supplied with nerves so

that it may contract, also contracts in labour apart from the rest of the uterus and with a different intensity. It is further suggested that the contraction of the cervix by itself induces a reflex contraction of the corpus; but not at the same time, otherwise contraction of the cervix would present a pathological obstacle to the work done by the corpus. There is thus a dual function of cervix and body.

Clinical observations are included in support of this theory of isolated excitability of the cervix. For example, on palpation of the orifice of the cervix with one hand and the body with the other, the cervix may be felt to contract apart from contraction of the corpus. Also, these contractions of the cervix may account for the sacro-lumbar pains in labour, which are continuous and occur apart from uterine contractions (" pains "). Sacro-lumbar pain due to contraction of the cervix is the first type of pain to yield to anti-spasmodic treatment (with "spasmalgin"). On the other hand, sacro-lumbar pain coinciding with contraction of the body of the uterus is due to a conflict between cervical resistance and body contraction and is much more difficult to overcome by sedation.

G. Gordon Lennon

78. Relations between the Uterine Os, the Isthmus Uteri, and the Presenting Part of the Foetus. (Uber die Beziehungen Muttermund, Grenzring und vorangehendem Kindsteil.)

By W. Wolf. Z. Geburtsh. Gynäk., 128, 113-127, June 1947. 7 figs., 20 refs.

79. The Second Stage of Labour: Internal Rotation. By L. A. CALKINS. Amer. J. Obstet. Gynec., 53, 488-493, Mar. 1947. I ref.

An attempt was made to determine the time of internal rotation of the head of the baby in relation to the stage and duration of labour in 2,900 primiparae and 2,500 multiparae, the time of rotation apparently being estimated clinically by various observers. It is stated that early rotation is more frequent in multiparae than in primiparae, but is unrelated to the size of the head. It is alleged to be influenced also by parity and the character of uterine contractions.

D. M. Stern

80. An Account of 243 Cases of Internal Version. (Versão internal sôbre 243 casos.)

By P. Schmidt Goffi. Rev. Ginec. Obstet, 2, 549-552, July 1947.

81. Can Stein's Method of Medical Induction be Improved or Replaced by Follicular Hormone? (Kann durch Follikelhormon der Erfolg medikamentöser Geburtseinleitung (Stein) verbessert oder ersetzt werden?)

By H. Tischer. Wien. klin. Wschr., 59, 154-157, Mar. 14, 1947. 13 refs.

The many enthusiastic reports of the efficacy of follicular hormone as a means of inducing labour, either alone or in combination with known methods, prompted the author to conduct a clinical investigation in 90 pregnant women to determine whether these methods actually gave better results in selected obstetric conditions.

The author observes that: (1) the Stein medical induction (ol. ricini and an enema at 7.30 p.m. followed 12 hours later by six half-hourly doses of 5 mg. quinine and then by five hourly injections of 0.2 ml. thymophysin) gives 50 per cent of successes; (2) the exact role of follicular hormone in labour is unknown; (3) the concentration of follicular hormone in the blood is known to rise steeply towards the end of pregnancy, to reach a maximum midway through labour, and to fall rapidly afterwards, suggesting that the highest concentration follows rather than precedes the onset of labour; and (4) the sensitivity of the uterine muscle to the oxytocic principle of the pituitary is enhanced by follicular hormone.

The cases were placed in one of four groups. Cases in Group I were given doses of from 5 to 30 mg. oestradiol benzoate intramuscularly; Group II. received doses of from 50,000 to 200,000 i.u. of "progynon" (oestrone) intramuscularly with "perlatanglycosid" intravenously; Group III. received 50,000 to 150,000 i.u. progynon intramuscularly with a Stein medical induction; and Group IV. 100,000 i.u. perlatanglycosid intravenously followed 12 hours later by a Stein medical induction.

The results of the four methods of induction in postmaturity (43 cases), prematurity (14), and premature rupture of membranes (40), with the incidence of inertia (37) and operative intervention (14), are shown in a table, together with an estimate in 9 cases of their efficiency in improving the quality of the uterine contractions. From these results the author makes the following deductions: (1) Follicular hormone alone is valueless as a means of stimulating the onset of labour in each of these conditions, except in cases of proved hormone deficiency or established hypoplasia; the incidence of inertia actually tends to be higher in this small series, while the use of large doses may be dangerous by inhibiting subsequent lactation. (2) Follicular hormone with a routine medical induction will be successful in 50 per cent of cases, but this result can be achieved by medical induction alone. (3) Little is known of the multiplicity of factors which initiate labour, but follicular hormone, though without direct effect, probably exercises a hormone nerve-regulating action. Failure of this mechanism may be caused, among other factors, by inactivation of follicular hormone in the body, by a biologdiminished by hormone, ically inefficient receptivity of the uterine muscle, and by the existence of a tone-reducing substance in the blood. E. D. Y. Grasby

82. Morbidity Associated with Induction of Labour. By M. A. ROBLEE. Amer. J. Obstet. Gynec., 53,

382-404, Mar. 1947. 31 refs.

The author reviews 500 cases of induced labour consisting of 3 groups. Group (1): 160 patients in the years 1925-27, at Barnes Hospital, all with viable foetuses at the onset of induction. Incidence of induction was 8.3 per cent. of parturient hospital admissions of at least 36 weeks' gestation. The combined maternal and foetal morbidity was 20 per cent. Elective rupture of the membranes was used rarely. Group (2): 140 cases during the years 1928-34 at the St. Louis Maternity Hospital, carefully selected to show the morbidity associated with a combination of the older technique of using pituitary extract, castor oil, quinine, bags, and bougies, and the newer practice of artificial rupture of the membranes when medical induction has failed. Incidence of induction was 13.5 per cent of parturient hospital admissions at term. The combined maternal and foetal morbidity was 40 per cent. Group (3): All the inductions for 1944 at the St. Louis Maternity Hospital. As in the other groups, all cases were of at least 36 weeks' gestation. Incidence of induction was 10.2 per cent of parturient hospital term admissions for the private service and 0.8 per cent for the ward service. The combined maternal and foetal morbidity was 20 per cent (150 cases). In addition, 50 cases were selected from a 1943 group of patients, taken largely from a controlled private service, where induction was by elective rupture of membranes and injection of pituitary extract. In these, the combined maternal and foetal morbidity was 8 per cent.

The morbidity of each case was studied. The standard of morbidity was a temperature of 100.4° F. or 38°C. for any 2 consecutive days of postpartum hospital stay. This afforded a minimum basis for classification as a "red" case. Induction during a first pregnancy carried a 41 per cent morbidity. The cases were divided into six general groups as follows:

	No. of cases	Classi- fied as " red "	Mor- bidity, %	Inci- dence %
I. Toxaemias	47	21	44	9
2. Disproportion 3. Ruptured mem-	31	19	бо	6
branes (not followed by induction of lab- our within 12 hours) 4. Post-mature as to estimated date of	14	11	8o	3
confinement 5. Before estimated	109	27	25	20
date of confinement 6. Estimated date of	168	31	18	33
confinement	131	19	14	26
Total	500	128	25	97

"In 1925-27, at Barnes Hospital, the series of 16 cases induced for disproportion between foetus and pelvis is in contrast to an incidence of 3 cases induced in the larger series of 1943-44 at the St. Louis Maternity Hospital." The author states that: "During the past 3 years no ward patients at the St. Louis Maternity Hospital have been induced except for toxaemia . . . With the elimination of pituitary injections, the incidence of cervical lacerations has been reduced an estimated 75 per cent." The requirements for elective induction are that: (1) term has been reached; (2) the head is engaged; (3) the cervix is effaced; and (4) dilatation has begun.

Among the 500 cases induction failed in 13 per cent, the failures being analyzed below:

Cases of Failed Induction	Percentage
Of all attempts to induce in contracted	J
pelvis (pelvis disproportion)	35
Of all attempts to induce toxaemia	
patients	25
Of all attempts to induce whose rup-	
ture of membranes was not pro-	
ductive of labour within 12 hours	21
Of all attempts to induce in the ante-	
mature more than 2 days before the estimated date of confinement	
Of all attempts to induce in the post-	II
mature after the estimated date of	
confinement	g
Of all attempts to induce within ±2	9
days of the estimated date of con-	
finement	9

[At one point the author states that "practically all observers have noted the ease with which toxaemias of pregnancy are usually induced by medical means", yet in 25 per cent of toxaemia cases induction failed when all methods were used. Again, the author has not always made clear the type of induction employed—medical, surgical, or both. However, the investigation is a most valuable and timely one, if only to warn of the risks attendant upon induction of labour.]

G. Gordon Lennon

83. Induction of Labour.

By P. L. PLAYFAIR. Med. Press, 218, 308-312, Oct. 1, 1947.

84. Induction of Labour by Aburel's Method. (La provocación del parto por el método de Aburel.)

By J. CARDUS and J. J. COBO. Clin. y Lab., 44, 186–187, Sept. 1947.

85. Clinical Use of a New Oxytocic Agent, "Partergin" (Methyl-ergometrine). (Uber die klinische Anwendung des neuen Wehenmittels Partergin.)

By G. Athanassiu. Z. Geburts. Gynäk., 127,

251-257, Jan. 1947. 2 figs., 18 refs.

86. Uterine Inertia.

By H. F. P. GRAFTON. Canad. med. Ass. J., 57, 341-345, Oct. 1947.

87. Uterine Ring Dystocia.

By H. W. Johnson. J. Missouri med. Ass., 44, 729-731, Oct. 1947. 2 refs.

88. Hernia of the Diaphragm as a Complication of Labour.

By B C. Murless. Brit. med. J., 2, 251-252,

Aug. 16, 1947. 5 refs.

Two cases of hernia of the diaphragin and one of eventration of the diaphragm in pregnant women are described. The condition is not excessively rare, but is not often referred to in medical literature. The symptoms commonly associated with the condition are those of gastric disturbance (nausea or vomiting) and dyspnoea, usually noticed after the thirty-fourth week. In all 3 cases described by the author dyspnoea was present during the second stage of labour. In I case there was vomiting in late pregnancy, which was worse after delivery and continued to be troublesome throughout the puerperium. The author gives his suggestions for treatment. During the late pregnancy the patient must rest more than usual, and if dysphoea is not relieved thereby she must be confined to bed. Small and frequent meals should be taken, and laxatives administered to ensure regular bowel action. In cases with severe encroachment on the thoracic cavity induction of premature labour must be considered. The usual sedatives may be given during the first stage; oxygen should always be available and should be given—especially during the second stage—if the patient becomes at all cyanosed. Delay of the head on the perineum should be treated by episiotomy and low forceps delivery, cyclopropane or local analgesia being used. In the majority of cases all symptoms disappear after delivery, and relatively few cases require operation. The prognosis in this complication of pregnancy is good. Rigler and Eneboe have re-examined after the puerperium 25 cases, in which small and moderate degrees of paraoesophagal hernia had been present in late pregnancy. In only 3 could the hernia still be demonstrated radiologically. Exact diagnosis of the condition is not usually possible without chest radiography.

Falkland L. Cary

89. Spontaneous Annular Detachment of the Cervix During Labour.

By C. B. INGRAHAM and E. S. TAYLOR. Amer. J. Obstet. Gynec., 53, 873-877, May 1947. 51 refs.

Fifty-four cases in which the second stage of labour was completed by spontaneous annular detachment of the cervix have been collected by the authors from the literature, and they add the details of a case they have observed themselves. In this case the first stage of labour had lasted fifteen hours with strong contractions but the cervix had

only dilated up to 3.5 cm. Slight continuous bleeding began, and after 22½ hours annular rupture of the cervix was found on internal examination. Spontaneous delivery occurred half an hour later. The puerperium is not mentioned, but 20 months later the patient was well but complaining of slight dysmenorrhoea. The vaginal portion of the cervix was deficient and of irregular contour.

In an analysis of the reported cases the following points were noticed: 75'per cent occurred in primigravidae, the average length of labour being 58 hours; cephalo-pelvic disproportion was presumed, on the available evidence, to be present in one-quarter of the cases; 4 maternal deaths occurred (7.4 per cent); puerperal morbidity was severe in 13 per cent and the foetal mortality was 29 per cent. [These facts strongly point to the advisability of perforning Caesarean section before labour has continued much more than 20 hours when the uterine contractions are strong and yet the cervix is but slowly dilating.]

Braithwaite Rickford

90. Air Embolism during Labour.

By G. W. MYLKS, A. B. BROWN, and C. N. ROBINSON. *Canail. med. Ass. J.*, 56, 427–429, Apr. 1947. 2 figs., 11 refs.

There are few recorded cases of air embolism during labour. Opinions vary considerably as to the amount of air which, introduced into the circulation, will cause death; different authorities mention from 480 ml. to 10 ml. as the minimum lethal dose. The cause of death varies; it may be due to mechanical interference with the right heart, blockage of the pulmonary artery or tributaries, and, when air has gained access to the systemic circulation, blockage of the coronary or cerebral arteries.

The authors report a fatal case of air embolism in labour. The patient was aged 32 years, 2-para, the first pregnancy being normal, and she had always been well. The expected date of delivery was June 30. On May 10 she reported with oedema, albuminuria, and a blood pressure of 163/194 mm. Hg. After 2 weeks at home she was admitted for treatment by rest and a high-protein, salt-free diet. Her condition improved and she was discharged, but soon got worse, and was readmitted on June 17 for surgical induction. This was attempted by stripping the membranes one day and inserting a Voorhees bag the next, but was unsuccessful and the bag was removed. It was decided to await the onset of spontaneous labour.

Labour started on June 27 at 6 p.m. At 8 p.m. pains were good but her temperature had risen. At 10 p.m. she had a rigor, and at 11 p.m. she vomited blood-stained fluid. At midnight shock developed and she became restless and cyanosed; as there was considerable loss per vaginam, a blood transfusion and infusion of 10 per cent glucose saline were given with continuous oxygen inhalation. At 1 a.m.

a stillborn child was delivered spontaneously, and

the patient died at 1.30 p.m.

At necropsy 2 hours later air bubbles escaped when vessels of the breast were cut, both lungs were collapsed, and air bubbles escaped when the right ventricle was opened. The liver was engorged and haemorrhagic and the gastric mucosa was haemorrhagic, the stomach containing a pint (568 ml.) of blood-stained fluid. On section the liver showed haemorrhage and necrosis, and the kidney marked degenerative changes with possible air bubbles in the glomeruli. The report stated that death was probably due to air embolism and there was evidence of gross toxic changes in the liver and kidneys.

The authors conclude that the air had entered from the site of a prematurely separated placenta, possibly situated low down, and comment upon the unexpectedly severe changes in the liver and

kidneys.

[This case is far from a simple one of air embolism, and is complicated by other factors. It presents interesting features, but is incompletely recorded and analyzed. For example, the pyrexia is lightly dismissed, and the time of onset and amount of the vaginal bleeding are not recorded, nor the relation of the bleeding to the onset of shock. No mention is made of the placenta or of the uterus at necropsy, and apparently the position of the placenta was not verified.]

L. W. Lauste

91. A Method of Prophylactic and Curative Treatment of Severe Post-partum Haemorrhage. (Sur un procédé de traitement prophylactique et curatif des hémorragies graves de la déliverance.)

By —. BERTROU. Gynéc. Obstét., 45, 826-829,

1946.

During more than 10 years in hospital service the author has never found the method described below to fail in the prophylaxis or treatment of post-

partum haemorrhage.

The procedure is to seize the posterior lip of the cervix with two pairs of forceps. Slight but firm traction on the forceps produces a re-orientation of the uterine mass which can be exaggerated if pressure is exerted on the fundus uteri by means of a hand on the abdomen. When the uterus is fixed between the hand and the forceps the situation is mastered. A cotton-wool tampon may be placed in the posterior fornix to maintain the forceps in good position. The forceps are left in place for 6, 12, or 24 hours. [All cases of haemorrhage due to retention of the placenta are, of course, excluded.] The author believes that this mechanism does not act by kinking the uterine vessels but by reflex stimulation causing contraction of the upper segment of the uterus. He maintains that the method is without danger and simple enough to be used by non-specialists. A case is described to illustrate the procedure.

G. Gordon Lennon

92. Prolonged Labour, with special reference to Postpartum Haemorrhage.

By A. M. WATSON. *Minnesota Med.*, 30, 945-948 and 996, Sept. 1947.

93. Placental Blood Loss.

By L. D. Odell. J. Kanas med. Soc., 48, 393-395, Sept. 1947. 8 refs. •

94. A Case of Triple Pregnancy with Multiple Placental Anomalies. (Embarazo triple con múltiples anomalías de la placenta. Caso clinico.)

By L. MAYORGA. Bol. Soc. Chil. Obstet. Ginec.,

12, 43-46, May 1947.

95. Acute Hydramnios in Univitelline Twin Pregnancy in an Rh-negative Mother. (Polihidramnios agudo en embarazo gemelar univitelino, en madre Rh negativa.)

By F. FIGUEROA. Bol. Soc. Chil. Obstet. Ginec., 12, 46-49, May 1947. I fig.

96. Post-partum Paralysis of the Lateral Popliteal Nerve. (Les paralysies du sciatique poplite externe dans le post-partum.)

By P. TRILLAT and M. DUMONT. *Gynéc. Obstet.*, 46, 413-419, 1947. 18 refs.

97. Postpartum Paravaginal Hematoma.

By S. Duckman and J. Tortora. *Brooklyn Hosp. J.*, 5, 153-156, July 1947. 9 refs.

#### ANAESTHESIA, ANALGESIA

98. The General Problem of Anesthesia in Obstetrics.

By E. B. Tuohy. *Minnesota Med.*, 30, 953-955, Sept. 1947. 7 refs.

99. The Question of Painless Delivery in Severe Injury of the Spinal Cord.

By A. A. Nikolskaya. Akush. Ginec., No. 4, 54-55, 1947.

100. Obstetric Analgesia by Lumbar Sympathetic Block. (Analgésie obstétricale par infiltration du sympathique lombaire.)

By J. SNOECK and C. Pirson. Acta clin. belg.,

2, 157-167. Mar.-Apr. 1947. 2 figs.

Methods of blocking the sensory fibres from the uterus in order to obtain obstetric analgesia have recently become more popular. These fibres arise in the wall of the uterus and join fibres from the other pelvic organs in the inferior and superior hypogastric plexuses, whence mainly parasympathetic fibres go to the sacral segment of the cord through the nervus erigens; sympathetic fibres pass through the presacral nerve to the last few ganglia of the lumbar sympathetic chain, and from the latter to the spinal cord through the white rami, the posterior roots, and the spinothalamic tracts, to the cortex.

Spinal, epidural, and continuous caudal techniques show that analgesia not affecting uterine

contractions is obtained only by blocking segments between D 9 and L 1; therefore the nervus erigens is not involved in uterine sensation. The authors found that infiltration of the hypogastric plexus had not effect. [No figures are given.] The work of Aburel and of Cleland shows that the sympathetic fibres must enter the cord at the level of L 1; Laffont and others found that injection of procaine into the aorta produced complete analgesia in labour without affecting contractions, suggesting that vascular spasm may play a part in producing the pain.

The authors' technique of blocking the lumbar sympathetic consists in marking the level of the lower border of the ribs on each side of the [? mid-] axillary line, this level corresponding roughly with the interspace between the second and third lumbar vertebrae. A needle is introduced at this level 8 cm. from the midline at an angle of 45 degrees until it glances against the body of the vertebra; it is advanced another centimetre, aspiration is performed, and 20 ml. of 1 in 1,000 "percaine" with adrenaline is injected. Bilateral injection gives instantaneous relief of pain in the first stage of labour

The authors used this method in 215 labours. The only complications were occasional tremors and agitation, relieved by ephedrine, and 1 case of accidental subarachnoid injection. Infiltration was best performed when the cervix was dilated 3 to 4 cm.; if the injection is made too early, pain may return before the cervix is fully dilated or incipient labour may be arrested. Analgesia was complete in 88.2 per cent, fair in 8.3 per cent, and poor in 3.5 per cent; the average duration was 4 hours. The effect on uterine contractions was as follows:

		Contractions						
Time of injection	Acceler- ated	Un- changed	Slowed	Stopped				
Cervix dilated								
less than 3 cm. Cervix dilated	13.5%	43.5%	40%	3%				
more than 3 cm.	16%	63%	20%	1%				

The second stage and puerperium were unaffected, forceps being applied in 4.8 per cent of cases (controls, 4.6 per cent). Unilateral (left) injection gives adequate but briefer analgesia, according to some authors; presumably diffusion to the other side always occurs. The technique described above ensures that the mother reaches the second stage of labour in good condition, without exhaustion, and that the child is unaffected.

D. D. C Howat

101. Sigmodal in Obstetrics. Clinical Observations with a Report of Three Reactions.

By A. M. LILIENFELD and D. McC. DIXON. Bull. Sch. Med. Maryland, 31, 135-143, Apr. 1947. 7 refs.

The effect of "sigmodal" (5-sed. amyl-5-betabromallyl barbituric acid) in labour was studied in a total of 391 patients. This little known barbiturate was clinically investigated first by Emmert and Goldschmidt in 1936; these authors published their results in a final series of 550 cases in 1941. A series of 166 cases was reported by Watson in 1942. In the present cases the drug was administered through a thin urethral catheter into the rectum. A dose of gr. 3 (0.2 g.) of "seconal" was given when the patient became uncomfortable, and the sigmodal was given when the cervix was 4 cm. dilated in a primigravida or, regardless of cervical dilatation, when uterine contractions were lasting for at least 35 seconds in a multipara. Within 5 to 15 minutes of the patient's receiving and retaining the sigmodal she shows signs of increasing drowsiness and generally falls asleep. A second dose is sometimes necessary. The first dose consists of 10 ml. of the preparation; the second, when needed, of not more than 5 ml. This dose may be repeated every 3 or 4 hours. In about 90 per cent of cases delivery is accomplished by episiotomy and the use of low forceps. A total of 223 cases was analyzed for amnesic effect. In 75.3 per cent there was complete amnesia; in 16.2 per cent almost complete or partial amnesia; and in 8.5 per cent no amnesic effect was obtained. The drug appeared to have no effect upon blood pressure, pulse rate, respiration rate, or foctal lieart rate, and 83.6 per cent of infants did not require any active resuscitation. Excitement and muscular twitchings were seen in a varying number of patients. In 3 cases severe respiratory depression occurred. These serious reactions may have been caused by variations in the nature of the drug, but were more probably due to over-dosage and to the added anoxaemic effect of nitrous oxide. The question of over-dosage is being further studied by means of blood-level determinations.

Falkland L. Cary

by Dolantin (pethidine). (Cuarenta casos personales de acortamiento de la duración del parto, por medio de la dolantina.)

By J. CARDUS. Toko-ginec. práct., 6, 95-101. Mar. 1947.

Following a previous report of 22 cases treated in labour with pethidine, usually in doses of 50 mg., the author now gives clinical details of a further 18 cases attended personally and treated with doses of up to 100 mg. intramuscularly. He concludes that this dosage is safe for mother and child, and that the drug has an anti-spasmodic action on the uterus and as a result of this shortens normal labour. A dose of 50 mg. is sufficient to produce an antispasmodic action, but in most cases is insufficient to bring about an analgesic effect. Although patients given pethidine may still complain, they are not agitated. The optimum time for its administration is when the cervix is between 2 and

3 cm. dilated. Uterine action is not depressed, and pituitary extract is not needed to a greater extent than normally. The author has formed the impression that if chloroform is needed for any procedure a smaller quantity has to be used if pethidine has been previously given, and the course of anaesthesia is smoother.

Bryan Williams

#### **PUERPERIUM**

103. Urine Examination in the Puerperium. (Onderzoekingen van urines van kraamvrouwen.)

By G. A. LINDEBOOM. Ned. Tijdschr. Geneesk.,

91, 1313-1318, May 24, 1947.

In order to determine quantitatively the incidence of urinary infections following pregnancy, the urine of 300 women was examined at the end of the puerperium. The results were as follows: (1) no pathological changes, 119; (2) urine sterile but albumin present with or without leucocytes, 98; (3) bacteria found microscopically but culture sterile, 7; (4) bacteria growing on agar-agar, 76. A month later the urine of 61 cases of the fourth group was re-examined and 19 specimens yielded a positive culture. Twelve of these patients were seen again 2 months later, and in 10 of them bacteria were still present in the urine.

Symptoms of infection in women with bacilluria were evident in 85.5 per cent on a first examination, 87.4 per cent on a second, and 100 per cent on a third examination. While at the first examination Bacterium coli was found in half of the cases, the other half having Proteus vulgaris, Micrococcus tetragenes, and staphylococci, at the last examination only Bacterium coli grew on culture. None of the cases was treated during the period of investigation. Women whose urine was or became sterile were not followed up. From this study emerges the significant fact that 4 months after delivery 10 women out of 300 (3.3 per cent) had clinical and bacteriological signs of urinary infection.

A. Lilker

104. Protracted Retention of Urine after Delivery. (Langvarig urinretensjon etter fødsel.)

By J. Lange. Tidsskr. norske. Lægeforen., 67, 515-516, Oct. 1, 1947. 2 figs., 5 refs.

105. Late Postpartum Bleeding: A Method of Prevention.

By H. W. Erving and H. A. Power. Amer. J. Obstet. Gynec., 53, 1019-1023, June 1947. 1 ref.

The authors found that every year 6 patients were readmitted to hospital, 2 to 6 weeks after delivery, for excessive bleeding. All needed curettage and packing; some needed transfusions. Many cases were treated as outpatients. A preventive routine has been evolved. Retention of placental tissue or subinvolution of the placental site is suspected if the lochia rubra persists after the sixth

or seventh day, particularly if subinvolution of the uterus and low-grade pyrexia exist. In such cases the uterine cavity is explored digitally in the ward. If a piece of tissue or marked elevation of the uterine wall is felt and the examination does not cause pyrexia, the uterus is evacuated and packed the following day. Recently penicillin has been given for 48 hours. If no abnormality is felt ergonovine (ergometrine) is given.

Over 8 years 134 such evacuations were performed. There was no mortality and the majority of patients had a smooth and rapid convalescence (8 developed a post-operative pyrexia of 100.4°F. (38°C.) or over for 2 consecutive 24-hour periods). No relation was found between late postpartum bleeding and age, parity, length of labour, method of delivery, mechanism of placental separation, multiple pregnancy, or viability of the child. In only 10 cases was true degenerating placenta found microscopically, the remaining material removed showing degenerating decidua-like tissue, chronic metritis, chronic interstitial endometritis, or necrotic debris.

[The authors give no figures to show the total population from which their cases are drawn. They have operated 134 times in order to avoid a potential 48 readmissions for haemorrhage, but do not state whether in fact this object has been attained. It seems likely that many of the 124 patients in whom placental tissue was not found would have made a good recovery without operation.]

Aileen M. Dickins

106. Hormonal Treatment of Deficient Lactation. Results with Crude Anterior-pituitary Extract.

By M. ROBINSON. Lancet, 2, 90-92, July 19, 1947. 5 refs.

From observations of 500 untreated lactating mothers it was found that successful lactation for at least 6 months followed in nearly every case where the milk output on the fifth day of the puerperium was 10 ounces (280 ml.) or more, and on the tenth day 16 ounces (448 ml.) or more. These quantities were therefore adopted as the criterion of establishment of lactation, and treatment was given according to the results of test-weighing on the fifth and tenth days of the puerperium. If on either day the milk yield fell short of the accepted standard, experimental or control treatment was instituted, starting as a rule on the seventh day and ending on the thirteenth. The milk yield was determined daily by test-feeds continued at all feeds until the fourteenth day, and then on an average of two consecutive feeds at the end of the fourth, sixth, and twelfth weeks and sixth month of lactation.

The experimental treatments were given as follows: (1) Crude ox anterior-pituitary extract, of which I ml. contained 250 mg. fresh ox anterior-pituitary tissue and possessed praeactin activity

equivalent to about 20 I.U., was injected intramuscularly into alternate buttocks in diminishing daily dosage of 5, 5, 2, 2, and 1 ml. (2) Crude ox anterior-pituitary extract was given together with synthetic hexoestrol, 1 mg. by mouth 4 times daily during the period of pituitary treatment. The crude ox anterior-pituitary extract was given with dried thyroid gland gr. 1 (.65 mg.) by mouth, 4 times daily during the period of pituitary treatment. (4) The crude anterior-pituitary extract was given with hexoestrol and dried thyroid gland by mouth in the dosage described.

The control groups received: (1) Breast massage as advocated by Randall. (2) Injections of physiological saline. (3) A proprietary galactogogue by

mouth. (4) No treatment.

The mean daily output of milk before treatment was practically the same in all groups, as was the increase in yield in treated and untreated patients up to the twenty-eighth day of lactation. Thereafter the mean daily output began to fall in the control groups, and when no treatment was given the breast milk had completely dried up by the end of the third month in every case. Of the control infants 15 per cent were still breast-fed at the end of the sixth mouth and it is noteworthy that any form of treatment is better than no treatment at all. The best results were obtained with the group given pituitary extract and dried thyroid, where 38 per cent of the infants were still being breast-fed by the end of the sixth month. In the group given hexoestrol besides crude ox anterior-pituitary extract and dried thyroid the results were no better than in the controls, and it seems possible that hexoestrol can counteract the effect of thyroid extract. Crude ox anterior-pituitary extract alone had no more effect than any of the control treatments, and seems to be of little value in stimulating lactation.

No benefit was obtained by continuing any form of treatment beyond the puerperium, the full effect of any stimulant to lactation apparently taking place during the first two weeks postpartum.

M, Baber

107. Iodine and Failing Lactation.

By M. Robinson. Brit. med. J., 2, 126-128, July

26, 1947. 1 ref.

During an investigation on the part played by hormones in failing lactation it was discovered that large doses of dried thyroid caused a greater increase in milk yield in puerperal women than any of the other hormone preparations. Lugol's solution of iodine in cases of failing lactation gave even more satis'actory results than those obtained with the dried gland. Failure of lactation was diagnosed where the output of milk was less than 10 ounces (280 ml.) on the fifth day or 16 ounces (448 ml.) on the tenth day of the puerperium.

In the series reported the diagnosis of failure was based on the milk yield on the fifth day,

and treatment was started on the sixth day. Twenty-seven patients were given 6 drops of Lugol's solution in milk by mouth twice a day. Of these 27, 7 results had to be discarded for various reasons. Seventy-two patients were used as controls; of these, 21 lactated normally, 11 were treated by breast massage, 19 were given daily intramuscular injections of 1 ml. of physiological saline, and 21 were given no treatment. The results are summarized in the following table:

	No		Day of puerperium				At four		
	of cases	5th oz.*		7th oz.					
Massage	11.	7	9	9	9	10	8	II	
No treatment	21	4	4	5	6	8	6	6	
Saline injection	19	5	5	6	6	8	9	12	
Lugol's solution	20	.5	6	8	12	15	17	21	
Normal	21	14	14	19	18	17	18	25	

\* I fluid oz. equals 28 ml.

The author concludes that in 20 cases of failure to establish lactation in the puerperium Lugol's solution increased the mean milk output by 300 per cent.

A. Doyne Bell

108. Breast Feeding and the Early Phase of Lactation.

By H. Waller. Mon. Bull. Min. Hlth., 6, 73-81,

May 1947. 6 refs.

The author in the present paper reports the results of his personal observations upon conditions which predispose to the frequent failure of breastfeeding during the second, third, and subsequent months of lactation, even when the function would appear to have been satisfactorily established during the first month. Many women who suffer this disappointment record that at first they seemed to have an excess of milk, but that their babies" could not get the milk out"; this difficulty is best explained by assuming that, as in veterinary physiology, the act of milking is unlikely to be successful unless there is a forcible secretory evacuation by the gland (" letting down" of milk) prior to the emptying of the reservoirs in which the milk accumulates. Women with previous experience of breast-feeding are usually aware of this intrinsic expelling mechanism and call it "the draught"; they realize that it causes a periodic sensation which signifies to them that the milk will flow easily when the child sucks. But in the first lactation a woman may not experience "the draught" during the first 20 to 30 days of lactation, and this may be taken to mean that the "letting-down" mechanism often takes time to establish itself. Until this occurs there is a danger of high milk tension within the breasts, and the glands are liable to cease secreting and to undergo involution if this tension is excessive and is not speedily relieved. Avoidance of early overloading of the breasts is to be sought by teaching women, especially during their first pregnancy, to expel their colostrum by hand-milking. A follow-up of 100 women who had been taught this procedure showed that 83 were successfully breast-feeding their infants at 6 months, as against 42 of the controls. Another review of 300 primiparae who came consecutively under the author's care and had received tuition during pregnancy gave the figure of 79 per cent breast-feeding successfully at 6 months.

There are occasions when the cautious use of stilboestrol may be of help in preventing painful and dangerous hypertension in the breasts; the author gives valuable practical advice regarding the prevention and treatment of injury to the nipples. At times failure of lactation may be due to lack of secretory tissue in the breasts, to developmental abnormalities of the nipples and lacteal sinuses, and to other structural variations which the author has studied by painstaking clinical observation.

[This paper is an outstanding contribution to the clinical study of a subject which has received surprisingly little scientific investigation; it should be read by all who have to deal with antenatal and neonatal care.]

N. B. Capon

109. Permeability of the Lactating Bovine Mammary Gland to Sulfonamides.

By V. T. Schuhardt, T. B. Carroll, L. J. Rhode, and H. Lacy. J. Bact., 53, 366-367, Mar.

1947.

The comparative permeability of mammary tissue for various sulphonamides is illustrated by experiments from the University of Texas and the Brucellosis Research Project of the Clayton Foundation. Cows received 90 g. of various sulphonamides in three equal doses at intervals of 4 Sulphathiazole, sulphapyrazine, sulphadiazine attained maximum blood levels of less than 5 mg, per 100 ml, of the free drug while only the last drug was demonstrable in the milk in a concentration of 1.1 mg. per 100 ml. Sulphanilamide, 2-sulphanilamido-5-bromopyridine, and 2sulphanilamido-5-chloropyrimidine attained maximum blood levels ranging from 5 to 13 mg. per 100 ml. of free drug. Only sulphanilamide and sulphapyridine came through the mammary gland into the milk in concentrations approaching those found in blood. Sulphapyridine gave the higher levels in milk. G. M. Findlay

110. The Inhibition of Lactation by Folliculin. By D. E. SHMUNDAK and M. D. SHEINERMAN. Akush. Ginec. No. 4, 56-57, 1947.

#### THE INFANT

111. Physiological Method of Resuscitation of the Newborn.

By I. S. LEGENCHENKO. Akush. Ginec. No. 4, 38-43, 1947.

112. Asphyxia of the Newborn. (Asfixia di recém-nascido.)

By C. CORREA DA COSTA. An. brasil. Ginec., 23, 449-468, June 1947.

113. A Case of Prolapse of the Umbilical Cord. (Sôbre um caso de prolapso de cordao.)

By H. Sachs. Rev. brasil. Chir., 16, 523-526, Aug. 1947.

114. Further Observations in Dental Defects in Infants Subsequent to Maternal Rubella During Pregnancy.

By M. W. Evans. Med. J. Aust., 1, 780-785,

June 28, 1947. 11 refs.

The coincidence of maternal rubella contracted during pregnancy with dental defects in the children is analyzed in 67 cases, 34 of which had been recorded previously by the author. Earlier conclusions are supported by the new evidence.

The time of tooth eruption and the incidence and degree of dental caries and of enamel hypoplasia are the main subjects of the study. The defects are graded according to their severity. Their character chiefly depends on the time of maternal infection. The foetal tissue of tooth structure is most vulnerable to any adverse influence during the first 3 months of pregnancy. Within this period 3 groups are distinguished: group A, up to the sixth week of pregnancy; group B, from the sixth to the eighth week; group C, from the eighth to the twelfth week. Retardation of eruption of the deciduous teeth—the most striking dental aberration—and enamel hypoplasia prevailed in the "early pregnancy" groups, when the mother was infected before the third month, I child in every 2 showing delay of eruption as against 5 per cent of the children of the "later pregnancy" group. Enamel hypoplasia affecting on the average 3 deciduous teeth was present in approximately 20 per cent of all cases (0.4 per cent is regarded as normal). Congenital absence of deciduous teeth and premature eruption of permanent teeth were also observed in the early groups. The greatest incidence of caries was observed in group B. After the third month of pregnancy infections influence the tooth development insignificantly. In all but 5 cases the dental defects were linked with at least one other congenital malformation due to maternal rubella infection.

M. Dynski-Klein

115. Congenital Defects as a Result of Rubella in the Mother during the Early Months of Pregnancy. (Medfødte misdannelser som følge av rubeola hos moren i de første svangerskapsmåneder.)

By H. HAGELSTEEN. Tidsskr. norske Lægeforen,

66, 777-778, Dec. 15, 1946. 4 refs.

The author describes 2 cases of congenital defects occurring in the children of women who had had rubella in the early months of pregnancy. In a female child aged 2 months there was pronounced

facial malformation, with deformation of the auricles and atresia of the external meatus. Hearing was apparently normal, although it was difficult to be certain of this point on account of the age of the patient. The palpebral fissures were small and the lateral canthi depressed. There were no abnormalities to be seen on ophthalmoscopic examina-The zygomatic arches were apparently missing on both sides. The mother had had rubella in the 13th to 14th week of pregnancy. There was no family history of congenital defect. second child, a female 41/2 years old, there were unilateral congenital cataract and also a patent ductus arteriosis. The mother had a febrile illness during the first month of pregnancy which was not diagnosed at the time but which was probably rubella.

D. J. Bauer

116. Hypercalcemia and Idiopathic Hyperplasia of the Parathyroid Glands in an Infant.

By E. L. PRATT, B. B. GEREN, and E. B. D. NEUHAUSER. J. Pediat., 30, 388-399, Apr. 1947.

14 figs., 12 refs.

An infant was studied by the authors from the age of 15 weeks until its death at 10 months. The leading symptoms were weakness, hypotonia, lethargy, anorexia, and malnutrition. Investigations revealed a constantly high blood calcium with low urinary calcium excretion and deficient renal function. Radiographs of bones showed some hypocalcification, and a biopsy revealed fibrosis of the marrow spaces.

At necropsy there was very slight enlargement of the parathyroids, which microscopically showed lack of stroma, great cellularity, and increase in chief cells and transitional water-clear cells. Some nephrocalcinosis and a calcium plaque in the aorta were seen, but no other metastatic calcification was observed. The bones showed osteitis fibrosa. The apparently unique association of hypercalcaemia with chief-cell hyperplasia is discussed, but no satisfactory explanation is offered.

N. M. Jacoby

117. Prematurity from the Viewpoint of the Obstetrician.

By N. J. EASTMAN. Amer. Pract., Phila., 1, 343-

352, Mar. 1947. 18 refs.

The author reviews the incidence of premature births in the Johns Hopkins Hospital between 1926 and 1945, during which time there were 28,493 deliveries and 3,331 premature infants—II.7 per cent. Excluding twins and premature artificial inductions, the incidence was only 10 per cent (7.2 per cent in white women, and 13.4 per cent in negresses). In 61.9 per cent no cause for the prematurity could be found. This latter figure differs materially from corresponding figures given by other authors, who usually find that not more than 40 or 50 per cent are unaccounted for; and the

author points out in explanation of the difference that the mere association of premature labour and some disease in the mother such as toxaemia or syphilis does not necessarily incriminate that disease as the causal agent.

He discusses possible causes in this group of 61.9 per cent. In 2,040 private cases, eliminating multiple pregnancies and premature inductions, the incidence of prematurity was 5.3 per cent. In 9,898 white ward cases it was 7.6 per cent, and in 9,926 negro ward cases 13.4 per cent. When such complicating diseases as toxaemia, placenta praevia, or syphilis were excluded, the prematurity rates in these three groups were 4.5, 6.7, and 11.8 per cent respectively. Patients were also divided into those receiving poor or no antenatal care, and those in whom antenatal care was adequate. In the former the incidence of premature births was 24.9 per cent and in the latter 7.8 per cent. The author considers that the explanation is that the patients who attend irregularly for autenatal care are in the main shiftless and improvident members of the community, their habits of living being just as ill managed as their habits in relation to antenatal care. This and all the other available evidence points to faulty nutrition being the chief cause of the difference in the incidence of prematurity in the various groups. "Thus far indeed it is the only one we have been able to suggest."

The following suggestions are made for lowering the mortality amongst premature infants. The diet of the expectant mother should be amplified in respect of minerals, proteins, and vitamins. Pills and capsules are no substitutes for the minerals and vitamins found in natural food, especially milk, meat, green leafy vegetables, citrous fruits, and whole-wheat bread and cereals. Vitamin K should be given at the beginning of labour to every woman, to prevent haemorrhagic disease of the newborn. No analgesic should be administered to women in premature labour except caudal, spinal, or local infiltration analgesia. Delivery should be preceded by a wide episiotomy, and the cord should not be tied till pulsation ceases. After birth the airway should be well cleared by a mucus extractor, oxygen administered, and the baby kept warm and handled

as little as possible.

F. J. Browne

118. Pre- and Post-natal Development of Immunity. Serum-albumin and Serum-globulin Levels in Maternal and Cord Bloods of Premature Infants.

By C. RIMINGTON and J. A. BICKFORD. Lancet,

1, 781–785, June 7, 1947. 2 figs., 35 refs.

To obtain information on serum protein levels of full-term and premature infants the total protein, non-protein nitrogen, albumin, and globulin were determined in the cord blood of 38 newborn children, whose conceptual age varied from 20 weeks to full-term. Parallel determinations were made on

maternal blood. Foetal albumin and globulin increase with length of gestation and at about the same rate. No significant change in maternal serum protein occurs during pregnancy, and there is little correlation between maternal and foetal values. It is suggested that a foetal method of synthesizing serum protein is in use in the early stages of gestation, and is later displaced by the adult method; this might explain the "serological immaturity" of the newborn.

Attention is drawn to the interest of the osmotic relations of foetal blood, with its low serum protein content. C. L. Oakley

119. Feeding of Premature Infants. A Comparison of Human and Cow's Milk.

By H. H. Gordon, S. Z. Levine, and H. McNamara. Amer. J. Dis. Child., 73, 442-452,

Apr. 1947. 17 refs.

Carefully controlled clinical studies were undertaken to compare the progress of premature infants given isocaloric amounts of human milk or of mixtures of cow's milk under comparable nursing and medical care, and environmental conditions. The subjects were all healthy prematurely-born infants. Any infant who became ill was excluded from the statistical analysis.

Three feeding mixtures were used: (a) human milk, (b) evaporated milk, and (c) half-skimmed powdered milk. The mixtures were given to the infants in the proportion of 55 calories per pound (0.45 kg.) of body weight. The human milk mixture was low in protein and high in fat and fluid compared with the cow's milk mixtures. The chief difference between the two cow's milk mixtures was the lower fat content of the half-skimmed powder mixture. Both mixtures of cow's milk contained larger amounts of calcium, phosphorus, and other minerals than did the human milk. The mean gain in weight was measured in grammes per kilo per day for a period of 21 days, from the 7th to the 28th day of life. For the 16 infants fed on human milk the average gain in weight was 12.5 g. per kilo per day, compared with 14.1 g. for the 39 infants fed on evaporated milk and 15.7 g. for the infants fed on half-skimmed milk. The differences were all significant.

The results of this statistical study support the laboratory investigations which suggest that mixtures of cow's milk are more suited for the peculiar needs of premature infants than human milk. This may be due to the higher protein content of cow's milk, although the possibility exists that the higher mineral content of cow's milk is also a factor. Since there is no significant difference in the weight gains for the larger infants (1,621 to 1,996 g.) on the 3 diets, it seems wise to feed the infants of this weight group on human milk whenever obtainable from individual mothers, in order to stimulate the mother's milk supply and thus permit more infants

It is concluded that under conditions of modern hospital practice, mixtures of cow's milk in amounts designed to give approximately 120 calories per kilo will produce larger gains in weight in premature infants than human milk. Mixtures of partially skimmed cow's milk are particularly indicated for smaller premature infants.

James M. Smellie

120. Prematurity—An Orientation.

By E. C. Dunham. New Orleans med. surg. J., 100, 119-125, Sept. 1947. 3 figs., 8 refs.

121. Cardio-esophageal Relaxation as a Cause of Vomiting in Infants.

By E. B. D. Neuhauser and W. Berenberg. Radiology, 48, 480-483, May 1947. 5 figs., 4 refs.

Persistent or recurring vomiting in the newborn or in young infants is a frequent problem. When severe, and especially when persistent regurgitation is alleviated by an erect posture, radiological examination is indicated. By this method during 3 years, the authors have found 12 patients whose symptoms were evidently due to "chalasia" of the cardia or failure of the oesophageal hiatus to contract. Retrograde barium filling of the oesophagus during inspiration or with increase in intraabdominal pressure with persistent relaxation of the sphincter is diagnostic. The condition appears to be a temporary aberration of the neuromuscular function of the hiatal portion of the oesophagus and of the diaphragm. There were no deaths in the series, and in only one instance had the condition continued beyond the neonatal period. Most cases are relieved if the infant is fed in the erect posture and maintained in this position for 30 minutes. In more severe cases the patient should be kept in a semi-sitting position day and night. Thickening of feeds with cereal may encourage gastric retention.

T. Semple

122. Syndrome of Acute Marasmus of the Newborn. Possible Pathogenic Role of the Middle Ear. (Le syndrome de dénutrition aiguë du nouveau-né. Rôle pathogénique possible de l'oreille moyenne.)

By —. Riviere, —. Chastrusse, and —. Moure. Gynéc. Obstét., 45, 832-835, 1946. 3 figs., 5 refs.

This is an article written apparently by paediatricians to draw attention to a cause of marasmus in the newborn which will respond to treatment. The authors believe that infection of the ear is to blame when in newborn babies there is a loss of weight without apparent cause, accompanied or not by acute coryza, vomiting, diarrhoea, and a slight degree of pyrexia, all resistant to any known treatment. They make a routine examination of the ears in these cases and perform bilateral paracentesis. There are two distinct types of case: (1) those in which the tympanum is normal or a little congested and paracentesis causes immediate amelioration of symptoms; and (2) those in which to be discharged from hospital on breast-feeding. Medic tympanium is very congested and paracentesis

causes issue of blood or pus, consistent with a

diagnosis of scrous or suppurative otitis.

Usually paracentesis is followed by an increase in weight. At other times the weight continues to fall after an initial rise; in these cases after 48 hours bilateral antrotomy is necessary. The authors claim that by this routine they have considerably altered the prognosis in the syndrome of marasmus of the newborn, and they append their results. In 45 such cases treated at the obstetrieal clinic there were 6 cases in which simple paracentesis was carried out, with 6 recoveries; 29 cases in which paracentesis was accompanied by the issue of blood, serous fluid, or pus, with 25 recoveries; 10 antrotomics were performed, with 1 recovery, 1 unknown result, and 8 deaths.

The authors now treat serous or purulent otitis with penicillin, followed, if necessary, by antrotomy in 48 hours. Another 19 cases had this treatment. In a further 19 cases in which this treatment was carried out, penicillin was given only on the day of death and in too small doses in 4 cases. The remaining 15 patients comprised 8 with simple otitis, all of whom recovered, and 7 in whom antrotomy was done; 3 of these recovered, and in 4 the dosage of penicillin was inadequate and antrotomy was too long delayed. The authors state that, of course, these numbers are too small to allow definite conclusions to be drawn, but they consider them worth while reporting.

G. Gordon Lennon

123. Disease of the Middle Ear in Dysentery in Infants.

By I. D. BEREZNYAK and V. I. Apostol. Vrach.

Delo., 26, 713-718, 1946.

The authors have investigated the frequency of otitis media in infants suffering from dysentery and and the effect of this complication upon the course of the disease. In all 96 infants were studied, 53 male and 43 female, aged up to 2 years. All were undernourished, and rickets was common; 40 had a mild or moderate attack of dysentery, and the remainder a severe one. The incidence of otitis media was 14.8 per cent. The mortality was 4.9 per cent, and 14 per cent in those cases where mastoiditis occurred as well. The infection was bilateral in 73 per cent of cases. The diagnosis of otitis media during the course of dysentery is difficult. Changes in the tympanic membrane are not marked and are not a reliable guide to the severity of the process; attention is usually drawn to the presence of the complication by a worsening of the general condition not attributable to the alimentary infection.

D. J. Bauer

124. Panophthalmitis in a Premature Infant Treated by Streptomycin.

By L. B. Somerville-Large. *Brit. J. Ophthal.*, 31, 362–366, June 1947. 2 figs.

The panophthalmitis in the case described was due to umbilical-cord infection. A little pus removed from the anterior chamber by a syringe showed the presence of *Proteus vulgaris* in pure culture. Penicillin by injection and sulphadiazine by mouth were ineffective. The administration of streptomycin intramuscularly was soon followed by improvement in the condition; streptomycin did not, however, prevent the eye from perforating. Swabs taken from the aqueous and vitreous were found to be sterile, a result no doubt effected by the streptomycin.

Eugene Wolff

125. Clinical and Actiopathological Study of 18 Cases of Megaloblastic Pernicious Anaemia in Infants. (Osservazioni cliniche ed etiopathogenetiche su 18 casi di anemia perniciosiforme megaloblastica nel lattante.)

By E. Picorella, G. R. Burgio, and T. Aversa. Riv. Clin. pediat., 45, 65-107, Feb. 1947. 3 figs.,

73 refs.

The authors describe a clear-eut syndrome oceurring in infants between the ages of 5 and 13 months which appears to be eaused by prolonged and exclusive breast-feeding or by inadequate mixed feeding coincident with a mild ehronic diarrhoea. The onset, with progressive pallor and development of a slight subicteric complexion, is usually between the ages of 6 and 9 months and may be preceded or accompanied by attacks of mild febrile diarrhoea or by infections of the respiratory tract. The development of the anaemic pallor is slow, and 3 months may clapse between its recognition and the time when medical advice is sought. On examination of the patient the pallor may be extreme and jaundiee scareely recognizable; slight enlargement of liver and spleen is usual, but the symptoms of the intercurrent infection may be most prominent. The blood shows anaemia with haemoglobin below 50 per cent and sometimes as low as 24 per cent; the colour index is usually over 1.2, though sometimes it is below 1. The mean corpuscular volume is usually over 100  $c.\mu$  and the mean redcell diameter usually over 7.5 µ. Marked anisocypoikilocytosis, and increase in modal corpuscular diameter (peak of the Price-Jones curve) are always present, and are most important in diagnosis. The bone marrow shows a moderate megaloblastic reaction, but normoblasts are always numerous and may outnumber megaloblasts. In about half the cases there were extrapyramidal nervous signs (mask-like facies, tremor, exaggerated tendon reflexes), and in a quarter there were pyramidal signs (positive Babinski).

Treatment by correcting the error in diet was curative in 2 cases, but in the remainder injection of liver extract was preferred owing to the debilitated state of the infants. Two infants died from respiratory infection, the others recovered rapidly and have not had a relapse. The authors conclude that the syndrome is caused by a lack of extrinsic

factor in the diet. This may be absolute, if breast milk is the only food, or relative, when insufficient other food is given and the infant develops a chronic diarrhoea. In 2 cases where diet appeared satisfactory the diarrhoea had been prolonged, and the syndrome could be compared with that of sprue.

[A similar syndrome was described by Zuelzer and Ogden (Amer. J. Dis. Child., 1946, 71, 3), so the condition appears to be widespread. These two papers are extremely valuable, describing the clinical and pathological findings with clarity; they should be read in the original by all concerned with anaemia in infancy.]

G. Discombe

126. Experimental Production of Anti-Rh Sera by the Use of Human Erythrocyte Stromata.

By F. W. Gallagher and G. P. Pillischer. Science, 105, 344-345, Mar. 28, 1947. 5 refs.

Rh-positive red cells were lysed with distilled water and the stromata washed until the supernatant fluid was free from haemoglobin. With the residue guinea-pigs were "immunized by repeated intraperitoneal injection". The guinea-pigs were subsequently bled and their sera were absorbed with Rh-negative red cells to remove the species agglutinins. Details are given of the reactions of two antisera produced in this way when tested against 109 samples of red cells which had previously been grouped with anti-Rh<sub>0</sub> [anti-D] serum. The results obtained with each guinea-pig serum agreed with the anti-Rh<sub>0</sub> results 103 times out of the 109. The two guinea-pig sera gave different results four times.

[Though it has possibilities from the point of view of research, the method is clearly unsuitable for the production of anti-Rh testing sera for routine purposes.]

R. R. Race

127. Heterospecific Pregnancy: I. The Clinical Importance of the Rh Factor.

By P. M. DE BURGH, R. A. SANGER, and R. J. WALSH. *Med. J. Aust.*, 1, 174-176, Feb. 8, 1947. 4 refs.

The authors report the results of tests for Rh antibody in the serum of 54 mothers who had children suspected to be suffering from haemolytic disease. In all but 7 either anti-Rh agglutinin or incomplete antibody (more often the latter) was found. [In 5 of the 7 the accompanying history does not look like that of haemolytic disease. Since all the mothers included were Rh-negative, there must have been 30 or so similar cases where the mother was Rh-positive; these have not been reported.] The authors conclude that "haemolytic disease in the infant is almost always associated with detectable evidence of iso-immunization when the disease is due to Rh incompatibility as the cause of foetal or neonatal disorder".

R. R. Race -

128. Two Popular Fallacies Regarding Rh. Preliminary Report of Some Thought-provoking Observations.

By P. G. HATTERSLEY. J. Lab. clin. Med., 32, 423-427, Apr. 1947. 14 refs.

Two fallacies in connexion with the Rh factor are described. The first is that only a small percentage of Rh-negative persons can become sensitized by transfusion with Rh-positive blood. The author examined the blood of a group of servicemen who at some time had received transfusions. A standard Rh, typing serum was used. All Rh-negative and most of the Rh-positive samples were sub-typed with sera of Rh' and Rh" specificity. A single drop of serum was incubated in a small tube with a drop of 2 per cent suspension of Rh, Rh, cells in 30 per cent bovine albumin, Rh-negative cells being used as controls. Sera found to be active against Rhpositive cells were titrated, the same cell suspension being used both in saline and in albumin and serum dilutions for the latter being made with normal serum. All sera showing anti-Rh activity were tested also with the blocking technique of Wiener. Of 122 samples examined, 20 were negative for Rh. factor; 2 were of type Rh' and I Rh". Of these 20 sera, 11 (55 per cent) contained Rh antibodies, all of the blocking or incomplete variety, and all were inactive against saline-suspended cells. against Rh, Rh, cells in albumin ranged from 1:1 to 1:5,120, while blocking titres ranged from 0.to 1:32. This percentage would probably have been higher if the subjects had been examined more recently after their last transfusions. It is concluded that every Rh-negative patient is capable of developing Rh antibodies, and should be transfused only with Rh-negative blood.

The second fallacy is that blocking antibodies are always of Rh specificity. With newer techniques "blocking" antibodies can be demonstrated by their active agglutination of Rh-positive cells in various viscous media. In the present study sera which agglutinated Rh, Rh, cells in albumin were tested for specificity by the same technique using Rho, Rh', and Rh" cell suspensions in albumin. Of the 10 sera tested, none was active in saline, but with cells suspended in albumin all agglutinated Rh<sub>o</sub> cells, 6 agglutinated Rh' cells, and 2 agglutinated Rh" cells. With Rho cells the titre ranged from 1:2 to 1:5,120 and with Rh" cells from 1:1 to 1:1,280, while with Rh" cells both titres were 1:1. These results were checked with the rabbit antihuman globulin technique. The serum with the highest titre of anti-Rh' antibodies was capable of blocking Rh' cells in saline, preventing their agglutination by standard anti-Rh' serum. Ten unselected sera from Rh-negative women sensitized by Rh-positive pregnancies were similarly examined with closely similar results. Of all 20 sera examined, 18 had no activity against Rh' cells in saline; 11 of these (60 per cent) agglutinated the same cells in albumin, while 2 with weak Rh' agglutinins acted

much more strongly in albumin. None of the 20 sera agglutinated Rh" cells in saline, while 3 (15 per cent) agglutinated Rh" cells in albumin.

J. L. Markson

129. The Rh Factor and its Clinical Interest. (Le facteur Rh et son intérêt en clinique.)

By M. L. Revol. J. med. Lyon, 27, 745-747. Oct. 27, 1947.

130. Symposium on the Rh Factor. I. Rh Factors and Their Relation to Obstetrics.

By S. F. Moore. Texas St. J. Med., 43, 307-311, Sept. 1947. 14 refs.

131. Symposium on the Rh Factor. II. Rh Antigens and Antibodies,

By J. M. HILL and S. HABERMAN. Texas St. J. Med., 43, 311-315, Sept. 1947. 16 refs.

132. Symposium on the Rh Factor. III. Routine Rh Testing in Obstetrics.

By J. L. Stown. Texas St. J. Med., 43, 315-320, Sept. 1947. 9 refs.

133. Replacement Transfusions in Erythroblastosis Fetalis.

By J. C. Knox. North Carolina med. J., 8, 574-577, Sept. 1947. 4 refs.

134. Influence of Vitamin B, on the Blood and Urinary Amylase of the Child. (Influenza della vitamin B, sull'amilasi ematica ed urinaria nel bambino.)

By M. Bolletti and E. Cossandi. Pediat. Med.

prat., 19-21, 388-397, Sept. 1946. 26 refs.

After receiving an intramuscular injection of 12.5 mg. or 50 mg. of synthetic ancurine 3 hours after a meal 20 healthy boys, from 1 month to 8 years of age, showed a decrease during the subsequent 3 to 6 hours of, in some cases, 50 per cent in the diastase content of the blood as estimated by a micro-Wohlgemuth method, with a return to the initial value in the course of 12 hours. Parallel with this a corresponding increase in the diastatic index of the urine was observed in 10 of the cases. Four boys, aged 4 months to 6 years, serving as controls and receiving no injection, showed a constant diastatic index in blood and urine throughout the day. It is suggested that the aneurine produces its effect by lowering the renal threshold for amylase.

T. R. Parsons

135. Sudden Deaths of Infants Allegedly Due to Mechanical Suffocation.

By J. WERNE and I. GARROW. Amer. J. publ. Hlth., 37, 675-687, June 1947. 6 figs., 31 refs.

In the International List of Causes of Death, cause No. 182 is entitled "accidental mechanical suffocation". In the U.S.A. in 1934, 834 deaths of infants under 1 year were classified under this heading; the number rose to 1,312 in 1944. One-

half to one-third of all fatal accidents during infancy are attributed to this cause. During the past 15 years 167 consecutive cases of infants ordinarily certified under this heading have been investigated by the authors. In no case did they find that an infant had been suffocated. In 43 cases neeropsy alone was sufficient to determine that death was due to a natural cause, mainly upper respiratory tract infection. In the remaining 124 cases histological study showed that fulminating respiratory disease was the most likely explanation for death in all except 15, in 6 of which no tissues were available for microscopical examination. An examination was also made of 67 other infants who had died suddenly in circumstances in which there could be no possible allegation of smothering. In these, acute respiratory disease was the usual cause of death, being present in 37 cases.

Analysis of the age incidence in notifications of suffocation shows that the peak occurs during the third and fourth months, notification is infrequent in the first month when, if suffocation is the cause of death, one would expect to find the highest incidence. The relative freedom from death from infection in the first month may be explained by assuming: (1) that there is less exposure to infection, and (2) that the infant is still protected by

maternal antibodies.

It is noted that the increase in notifications under No. 182 is accompanied by a decrease under No. 67 (disease of the thymus gland-mainly status lymphaticus) and No. 200 (undetermined causes of death). The view that a healthy baby will resist all attempts at suffocation is endorsed. The authors conclude that cause No. 182 is erroneous, and that efforts to prevent sudden death in infants should be directed towards diminishing exposure to infection and towards educating parents in the early signs of acute respiratory disease.

P. N. Meenan

### OBSTETRIC OPERATIONS

136. Prophylactic Intraperitoneal Sulphanilamide in the Obstetric Surgery of the Infected Case. (La sulfanilamida intraperitoneal profilactica en la cirugia obstétrica del caso impuro.)

By M. L. PEREZ. Rev. esp. Obstet. Ginec., 5,

201-218, Oct. 1946. 4 figs.

After a detailed review of the mortality reported for the various forms of Caesarean section in the infected case, particularly in South America, the author concludes that the lower segment operation does not protect against sepsis, and that the mortality from peritonitis remains about 4.3 per cent. In an attempt to reduce this figure, the author and his colleagues since 1942 have been applying sulphanilamide powder to the region of the uterine incision and to the peritoneum and pelvic cavity when carrying out a transperitoneal lower segment operation. In a total of 734 infected cases operated

on by many different surgeons, there have been 6 deaths from peritonitis, a mortality of 0.81 per cent. [The mortality from all causes is not given.] In 96 of the author's patients there were no deaths from peritoneal sepsis. After 613 transperitoneal operations in infected cases there were 2 deaths from peritonitis (0.32 per cent mortality), and after 120 extraperitoneal operations there were 4 deaths (3.33 per cent mortality). The author considers that the trauma of the extraperitoneal operations interferes with local resistance to infection, and he also disapproves of drainage.

The effect of chemotherapy on morbidity, which in the literature amounts to 33.2 per cent, has also been studied. [No definition of the term "morbidity" is given.] With sulphanilamide given by the peritoneal and parenteral routes, this has amounted to 58 per cent, but has been reduced in small numbers of cases to 25 per cent when sulphanilamide has also been given by the intrauterine route, and to 14.2 per cent when parenteral penicillin has been given, in addition to intraperitoneal and parenteral sulphanilamide.

The author recommends the following technique for all infected or suspicious cases. The lower segment transperitoneal operation is carried out with the minimum of trauma and displacement of the peritoneum. The uterine contents are absorbed mechanically, and 4 g. of sulphanilamide powder is applied along the suture line and to the abdominal wall, but mainly to the pelvic cavity. Parenteral sulphanilamide is administered for 72 hours after operation, a blood level of 6 mg. per 100 ml. being maintained, with estimations twice daily. Parenteral penicillin is also given, beginning either before or after operation, 200,000 units being given in 48 hours. The author concludes that the problem of the infected case is now solved by the use of the transperitoneal lower segment operation and peritoneal and parenteral chemotherapy.

[The lower segment technique, better anaesthesia, and chemotherapy have made Caesarean section a relatively safe operation. Nevertheless it would be unwise to conclude that the question of sepsis in obstetrics has been permanently solved, and it should be considered rather that the streptococcus and its allies have "gone underground", awaiting their opportunity to appear in a drug resistant and perhaps more virulent form.]

Bryan Williams

137. Failed Forceps.

By J. K. FEENEY. Irish J. med. Sci., 190-210,

May 1947.

Thirty recent reports from the 3 Dublin maternity hospitals have been studied to provide the material for this detailed review of 121 cases of failed forceps. Seventy-seven cases were admitted to hospital after delivery had been attempted outside, and 44 failures actually occurred in hospital.

Discussing the cases of failed forceps admitted to

hospital, the author analyzes his material under five headings: (a) abnormal cephalic presentations; (b) hydrocephalus; (c) cases in which the reason for failure appeared to be that the conditions necessary for low forceps application in domiciliary practice were lacking; (d) cases in which disproportion between the presenting head and the maternal pelvis was strongly suggested by the previous and present obstetrical history of the patient, by the mode of delivery in hospital, by clinical and/or radiological examination of the pelvis in hospital, or by the weight of the baby; (e) constriction ring dystocia. Each case is briefly described, and a summary given for each group. There were 17 patients in Group A, of whom 4 died (mortality 23.5 per cent). Foetal mortality was 76.5 per cent. In Group B, of 6 patients I died of injection on the eighteenth day (mortality 16.6 per cent). Of 28 patients in Group C 5 died (mortality 17.8 per cent). Foetal mortality was 53.5 per cent. In Group D 3 patients died out of a total of 24 (mortality 12.5 per cent), and the foetal mortality was 70 per cent. Both patients in Group E survived and one baby

The total figures for these five groups show that 38 patients were primigravidae and 39 multigravidae. Of the 13 deaths 5 were due to infection and 6 to shock, haemorrhage, and in ection, alone or combined. One patient died of oedema of the lungs and one of cardiac failure. Of the babies 25 survived, 49 were stillborn, and 3 died in the neonatal period (a mortality of 67.5 per cent, or 60 per cent if the hydrocephalics are excluded). All the patients who died were in a poor condition when admitted to hospital. The mortality rate is compared with that quoted by Munro Kerr for an almost similar number of cases (7 per cent). All but two of the deaths occurred after the introduction of the sulphonamides in 1935-36, and the author expresses the hope that penicillin in conjunction with the sulphonamides will bring improvement. Blood transfusion was used with benefit in the treatment of several of the surviving patients but does not appear to have been in general use.

The second part of the paper deals with cases of failed forceps in hospital; out of a total of 44 patients, 28 were primigravidae and 16 multigravidae. Three patients died, a mortality of 6.8 per cent; 25 babies survived, 17 were stillborn, and 2 died in the neonatal period, a foetal mortality of 43.2 per cent. Symphysiotomy or pubiotomy was performed on 12 occasions without maternal death and 10 of the infants survived. There was no postoperative orthopaedic disability in any of these cases, and it is stated that symphysiotomy would appear to be the ideal operation for certain cases of mid-pelvic and outlet contraction.

The author stresses the fact that in just over half the cases admitted from outside, the cervix was not fully dilated, and that 15 of the 30 estimated cases of disproportion occurred in parous patients. A plea is made for improvement in the teaching of

obstetrics to students and postgraduates.

[This comprehensive and critical review of the causes of "failed forceps" makes depressing reading, and emphasizes that either the teaching of obstetrics falls short in its aims or those who have been taught have rapidly forgotten what they have learned.]

E. L. Nicolson

138. The Influence of Oestrogen upon the Healing of Vaginal Wounds in Rats. [In English.]

By A. Sjovall. Acta obstet. gynec. scand., 27,

1-10, 1947. 5 figs., 21 refs.

This paper describes the results the author has obtained experimentally in rats while investigating, at the Obstetrical and Gynaecological Clinic in Lund, the effects of oestradiol on the healing of wounds. Mature white rats were used, and all were spayed 7 days before the investigation. Small areas of vaginal mucosa were then removed. Subcutaneous injections of oestradiol benzoate in varying doses were then given and the animals killed 4 or 5 days later. Healing was estimated macroscopically and microscopically in these test animals (17 in all), and also in 19 controls. Healing was present 3 times more often in the animals given oestrogens.

Braithwaite Rickford

139. Remarks on 78 Caesarean Sections: Indications, Techniques and Results. (Remarques sur une serie de 78 césariennes: indications, techniques, et résultats.)

By L. GIOANNI. Rev. franç. Gynéc. Obstét., 42, 245-252, July-Sept. 1947.

140. Incidence of Caesarean Section.

By A. L. Hunter. Wisconsin med. J., 46, 905-907, Sept. 1947. 2 figs.

141. Indications for Caesarean Section. (Indikation sur Kaiserschnittentbindung.)

By U. von Ruette. *Praxis*, 36, 711-714, Oct. 16, 1947. I fig., 15 refs.

142. Caesarean Section at the Gottingen University Clinic for Women, 1926–1946. (Der Kaiserschnitt von 1926 bis 1946 an der Göttinger Universitäts-Frauenklinik.)

By A. STADTMULLER. Z. Geburts. Gynäh, 127, 271-288, Jan. 1947. Bibliography.

143. Influence of Surgical Technique and Operative Indications on the Prognosis of Caesarean Section. (Influence respective de la technique chirurgicale et de l'indication opératoire sur le pronostic de l'opération césarienne.)

By A. GINGLINGER. Rev. franç. Gynéc. Obstét., 42, 233-235, July-Sept. 1947.

144. Some Observations on the Length of the Cutaneous Incision in Transverse Lower Segment Caesarean Section with Exteriorization. (Quelques

considérations sur la longueur de l'incision cutanée dans le césarienne basse transversale avec extériorisation.)

By E. Lartigaud. Rev. franç. Gynéc. Obstét., 42, 253-255, July-Sept. 1947.

145. What are the Advantages of Exteriorization of the Uterus at Transverse Lower Segment Caesarean Section? (Quels sont les avantages de l'extériorisation de l'utérus faite d'emblée lors de l'exécution de la césarienne basse transversale?)

By R. Keller. Rev. franç. Gynéc. Obstét., 42, 225-232, July-Sept. 1947.

146. Difference of Haemorrhagic Complications of Lower Segment Caesarean Section with Transverse and Longitudinal Incisions. (Différence des complications hémorragiques de la section césarienne basse suivant incision transversale ou longtitudinale du segment.)

By P. Burger. Rev. franç. Gynéc. Obstét., 42,

256-258, July-Sept., 1947.

#### GYNAECOLOGY

General

147. The Question of Pseudo-appendicitis in Gynaecology. (La cuestion de las falsas apendicitis en ginecologia.)

By M. GARRIGA ROCA. Med. Clin., 9, 108-112,

Aug., 1947. 9 refs.

1.18. The Constitutional Type of Precocious Puberty. By A. M. Hain. J. clin. Endocrinol., 7, 171-185,

Mar. 1947. 2 figs., 36 refs.

The causes of precocious puberty are reviewed, and a series of 7 patients, 5 girls and 2 boys, with this condition is described. All these cases showed an increase of gonadotrophin in the urine equivalent to an adult excretion, and in all there was some increase in the 17-ketosteroid output for their age group. The highest figure was 6 mg. in 24 hours at the age of 6½ years. In 2 cases a pregnane derivative was excreted in the urine, which is at present unidentified. The mechanism of the production of these manifestations is discussed.

E. F. Scowen

149. Clinical Features of Precocious Puberty with Special Reference to the Type due to Endocrine Influence. (Das Krankheitsbild der Pubertas praecox unter besonderer Berucksichtigung der endokrin bedingten Frühreife.)

By L. Herold. Zbl. Gynäk., 69, 55-62, 1947. 1

fig., 30 refs.

Disorders of Function

150. Studies on Hypometabolism. II. Hypogonadism. A Nosological Unit in Young Women. [In English.]

By E. D. Bartels and P. Hjorth. Acta med. scand., 127, 313-341, Apr. 25, 1947. 2 figs., 15 refs.

During the German occupation of Norway a common finding among the population was loss of weight, but many doctors were impressed by the large number of young woman who complained of obesity and menstrual disturbance. It was noted that many had a low basal metabolic rate (B.M.R.) [a finding rare in obese patients in England and America]. The authors take the view that the condition was not, in fact, provoked by war conditions, but had hitherto been hidden under the various diagnoses made by the specialists to whom the patients presented themselves, the choice of specialist and therefore the choice of diagnosis depending on the main symptoms. Thus, in their view, cases have previously been labelled secondary adiposity, myxoedema, mental amenorrhoea, depression, cardiac neurosis, hypothalamic disorder, and "nuchal myosis".

Fifty cases are described. The story of each patient is approximately the same. A hitherto healthy young woman with normal menstruation begins to put on weight. At the same time the menses become scanty or cease, libido decreases, and various nervous symptoms are noted. The authors' conclusions from their investigations are as follows: (1) That in a high proportion of their patients there was depression of ovarian function [the conclusion appears likely on clinical grounds, but the laboratory investigations, on which much stress is laid, are of no significance]. (2) That the B.M.R. is lowered. [The figures given do not suggest that a lowered B.M.R. is an important part of the syndrome. The authors themselves stress, correctly, the absence of any correlation between adiposity and hypometabolism.] (3) That changes in hair growth are common-dryness, greasiness, falling of the hair, and splitting of the hair being present in over half the cases; these changes were not obvious on clinical examinations. (4) That nervous com plaints occurred in almost every case, the commonest being tiredness, anxiety, and depression often associated with such autonomic signs and symptoms as acrocyanosis, hot flushes, and undue perspiration. The authors draw attention to the possibility that there is a central nervous origin of these symptoms and indeed of the whole syndrome.

[Many of the signs and symptoms of this "syndrome" are inconstant, and a few of the cases described seem to be "dragged in" with some difficulty, but it would appear that two features are almost constant—increase in weight and depression or anxiety. The authors are not apparently aware of previous work on this association. The abstracter drew attention to it in 1946 (Postgrad. med. J., 22, 169), and explained it on the basis of Verney's work on the relation between emotion and water retention. Verney and his associates (for references see the above paper) showed that in dogs, anxiety, probably by way of the hypothalamus, caused an increase in posterior pituitary secretion, with a consequent diminution of water excretion. Greene

suggested that the "adiposity" which he had observed as a system of anxiety was due largely to water retention and was of similar causation. A reexamination of their patients by Bartels and Hjorth would probably suggest that "hypogonadism" is a title which stresses unduly a relatively unimportant and inconstant feature of the syndrome. They might also be inclined to revise their view that the occupation of Norway by the Germans had no influence on its incidence.]

Raymond Greene

151. The Treatment of Amenorrhea in Young Women.

By L. M. RANDALL. Amer. J. Obstet. Gynec., 53,

453–458, Mar. 1947. 1 ref.

This paper, from the Section of Obstetrics and Gynaecology, Mayo Clinic, deals with the procedures employed in the treatment of a group of 87 young women with amenorrhoea of I to 4 years' duration. Cases where tumours were found are excluded. The nutritional state is important and is first investigated. Patients suffering from anorexia nervosa or functional anorexia are given a balanced ration rich in proteins and vitamins. An estimate of the calorie intake is made, and to this amount 300 calories is added daily. After 5 or 6 days a further 300 calories is added, this procedure being continued until the intake is about 3,500 calories, after which the basal metabolic rate returns to normal and weight increases. Cyclic administration of oestrogens may then be started in an attempt to shorten the period of uterine atrophy usually occurring in these cases. When examination of the endometrium reveals hypoplasia it is advisable to begin cyclic administration of oestrogens for 2 or 3 weeks in every 4. Diethylstilboestrol is generally used, given to the limit of tolerance. This form of treatment stimulates the uterus and endometrium and indirectly the pituitary body. By the addition of progesterone a more complete stimulation may be achieved.

Thyroid extract is generally recognized as efficacious in the treatment of amenorrhoea in properly selected cases. It is important to determine the basal metabolic rate (B.M.R.) before beginning treatment. If the B.M.R. is -15 to -20 per cent the patient is given gr. 3 or 4 (0.20-0.25 g.) of desiccated thyroid substance daily for 3 days, gr. 2 (0.13 g.) for 3 days, and then 1 to gr.  $1\frac{1}{2}$  (0.065– 0.1 g.) daily. The B.M.R. is again estimated after the first week, after which it is usually possible to determine the maintenance dose, which may have to be continued indefinitely. Estimation of the B.M.R. from time to time is advisable. In the presence of a lowered B.M.R. other forms of substitutional treatment are ineffective. In some cases thyroid extract is the only treatment necessary.

X-ray irradiation in small doses to the pituitary

or ovaries, or both, has been used safely and effectively at the Mayo Clinic for 18 years. Such treatment is often successful in re-establishing the menses, but the effect is frequently only temporary and treatment has to be repeated. It is more successful in cases where amenorrhoea is due to pituitary failure. Extrinsic gonadotrophins, though they have a place in the treatment of amenorrhoea, were little used in this series.

In 17 of the 87 patients there was ovarian dysfunction; in 36 there was evidence of pituitary failure; 26 responded to treatment. Fifteen had anorexia nervosa; 8 were cured. Nineteen had primary amenorrhoea; in 3 of these menstruation started after treatment.

T. C. Clare

By M. INGERSLEV. Acta obstet. gynec. scand.,

27, 17-32, 1947. 7 refs.

Brief mention is made of the earlier work of Jaboulay, Leriche, and Cotte in introducing this paper. The author then describes the results obtained in 34 cases treated by presacral neur-

ectomy at Bispebjerg Hospital.

Most of the 9 patients with spasmodic dysmenorrhoea in this series had been treated for a long time by various medical means and by dilatation of the cervix. Six patients were symptomless 2 to 5 years after presacral neur-ectomy and 2 were improved. Seventeen were operated on for symptoms attributed to "cystic degeneration of the ovaries ". Presacral neurectomy and also appendicectomy and ignipuncture were carried out. One patient alone was cured for 5 years, and 4 others were temporarily relieved. The third group consisted of 12 patients who suffered from chronic pelvic pain, often severe enough to make them incapable of work. Laparotomy usually revealed only a minor pelvic lesion. Sympathectomy was combined with various other procedures, appendicectomy in all, suspension in 2, and salpingo-oöphorectomy and oophorectomy in 4 others. Results were not good; 5 patients were without pain for between 9 months and 21/2 years, but subsequently relapsed. One of the patients relieved had a chronically infected Fallopian tube removed.

Reasons for these disappointing results are discussed. Selection of unsuitable cases played a part; it is hoped to banish this source of error by trying the effect of I per cent procaine, injected into the lower part of the lumbar sympathetic before operation. Another reason for failure is that many operations were carried out by house officers who removed only "some few nerve fibres". Post-operative complications were few, there being one case of pneumonia. Catheterization was necessary in only 3 cases. Sexual conditions were unchanged by removal of the presacral nerve.

Braithwaite Rickford

153. Curve of Urinary Elimination of Follicular Hormone Administered Parenterally. (Curva di eliminazione urinaria dell'ormone follicolare somministrato per via parenterale.)

By R. CANDIDO. Arch. Ostet. Ginec., 52, 50-63,

Jan.-Feb. 1947. 2 figs., 19 refs.

In order to assess the functional capacity of the female gonads in relation to oestrogenic hormones, the author investigated the urinary oestriol after administration of oestrogens by parenteral injection. It is generally agreed that the whole of the oestrogen administered in this way is eliminated in the urine as oestriol.

The oestrogen employed was "progynon B. oleosum" (in ampoules of 10,000 i.u. of oestradiol benzoate). The test does not offer particular difficulty or danger to the patients. The 10 subjects were unmarried women between the ages of 18 and 27 years; 5 had a normal menstrual cycle, the remaining 5 having some form of menstrual dysfunction. The intramuscular injection of 20,000 i.u. was given between the eighth and the tenth days from the end of the menstrual period. Specimeus of urine over a period of 24 hours before injection and specimens obtained 12, 24, 36, 48, 60, and 72 hours after the injection were collected, and the oestriol was quantitatively estimated.

The results in the group of women with a normal menstrual cycle show that the variation in the urinary concentration of oestriol after the injection of oestrogens is much the same in all the subjects, though with notable individual differences. The shape of the curves is therefore uniform, although it is not possible to superimpose one on another. A peak was reached (constantly above 2,500 units per litre) in 12 hours after injection, and the curve then dropped slowly to reach pre-injection level after 72 hours. In the second group, after the twelfth hour the concentration of oestriol decreased or oscillated in various ways: subsequently the level rose again to a variable extent. The oestriol retention after the first 12 hours is probably due to a state of deficiency of the oestrogenic hormone. The altered behaviour of the curve in the succeeding hourly estimation has not been explained. However, from the results obtained it can be assumed that it is possible to investigate the follicular function of women in the menstrual cycle by this method. Each variation in behaviour of the curve indicates the likelihood of of functional follicular irregularity. The method represents a useful diagnostic aid, and can be used to reveal a condition of follicular deficiency, thereby providing a basis for therapy.

Rina Saunders

154. The Effects of Penicillin Administration on Menstrual and Other Sexual Cycle Functions.

By A. E. W. McLachlan and D. D. Brown. Brit. J. vener. Dis., 23, 1-10, Mar. 1947. 26 figs., 5 refs.

This paper makes a welcome assessment of physiological disturbances occurring in the female during penicillin treatment for venereal disease.

One healthy volunteer and 2 patients with trichomonas vaginitis were given 5 three-hourly injections of 30,000 units of commercial penicillin; all subsequently showed some menstrual disturbance. After this observation, 216 non-pregnant women (106 of whom received 2,400,000 units and the remainder 300,000 units or less), 32 pregnant women, and 16 others treated during the puerperium were observed for 4 consecutive monthly periods after the drug had been administered.

Of the 216 non-pregnant women 188 (91.3 per cent) showed some change in the menstrual cycle: 57.3 per cent for I menstrual period, 21.4 per cent for 2 periods, 5.8 per cent for 3, and 6.8 per cent for 4. The cycle was lengthened in 27.2 per cent, shortened in 32.7 per cent, and unaffected in 40.1 per cent. Menstrual loss was increased in 56.1 per cent, decreased in 2.5 per cent, and unaltered in 41.4 per cent. The duration of menstrual flow was lengthened in 44.5 per cent, shortened in 11.7 per cent, and unchanged in 43.8 per cent. Approximately one-third developed dysmenorrhoea but 10 per cent who had previously suffered from this were temporarily relieved. Eight patients, 6 of whom received 2,400,000 units, had mittelschmerz. Efforts to relate these effects to the time in the menstrual cycle when the penicillin was given were a failure; when sequelae did occur the same individual pattern was followed if the penicillin was repeated.

Eight patients suffering from physiological amenorrhoea of 2 to 6 months' duration without demonstrable cause menstruated after treatment with penicillin. Two menopausal patients who had suffered from amenorrhoea for 3 and 9 months respectively experienced some temporary uterine bleeding. Of 32 pregnant patients, 20 receiving 2,400,000 units and 12 only 300,000 units or less, 12 experienced uterine cramps and 3 had bleeding in addition. The cramps usually occurred on the first day and labour ensued in 5 patients. Three of these were between the seventh and ninth month of gestation; in 2 the foetus was dead. The remaining 2 labours took place at term. Of 16 patients treated in the puerperium, 12 with large and 4 with small amounts of penicillin, 4 had increased and 8 diminished lochial discharge while under treatment. Lactation diminished in 9 and ceased in 3.

It is suggested that these effects are due to impurities in the penicillin. With more recent batches of penicillin they have diminished in frequency despite increased dosage. In 2 patients treated recently with pure penicillin there were no such sequelae.

R. R. Willcox

155. Study of the Ovary, the Endometrium and Menstrual Anomalies. (Estudios sobre el ovario, el endometrio y las anomalías menstruales.)

By P. A. GOMEZ HERRERA and J. M. BEDOYA

GONZALEZ. Rev. esp. Obstet. Ginec., 5, 233-236, Oct. 1946. 2 figs.

In a series of cases of menstrual disturbance the authors have correlated the clinical findings with the pathological state of the ovary and endometrium, and, without going into details of technique, report and discuss their results. Their 57 cases are divided into 3 groups.

- (a) Defective menstruation (amenorrhoea, oligomenorrhoea, and hypomenorrhoea), 7 cases. In this group, in addition to the classical cases due to hormonal deficiency, are some thought to be the result of excess of oestrogen and progesterone. In the cases due to excess of oestrogen a proliferative or hyperplastic endometrium fails to bleed as a sudden fall of oestrogens is lacking. The amenorrhoea is usually short, but has been observed to last a year. Corpora lutea are absent, but oestrogens are steadily produced. The explanation of the cases due to excessive progesterone is more uncertain, and some authors do not believe in the existence of persistent corpora lutea apart from pregnancy. There were 7 cases in this group, and all except 2 were operated on in the second half of the cycle. In 4 the endometrium was proliferating normally, in 2 it was in a secretory phase, and in I it was moderately hyperplastic with secretory change. The ovaries in 2 cases showed atretic follicles and fibrothecal masses, and in the other 5 single or multiple follicular cysts. In the 3 cases with secretory change active corpora lutea were found.
- (b) Menorrhagia, 28 cases. The endometrium in 14 cases showed a definite hyperplasia. In 9 it was in a normal proliferative state, but in 3 of these there was evidence of tuberculosis. In only 4 was there a complete secretory phase and in 1 an incomplete phase. The ovaries in 16 cases showed multiple follicular cysts, in 4 cases a luteinized follicular cyst together with other follicular cysts, in 3 cases numerous atretic follicles together with fibrothecal masses, in 4 cases an active corpus luteum together with follicular cysts, and in 1 case a large haematoma with lutein cells in its wall.
- (c) Metrorrhagia, 22 cases. The endometrium in 16 cases showed definite hyperplasia; in 1 of these a polypoidal endometrium with cysto-glandular changes was associated with normally proliferating endometrium; in 5 cases there was a proliferative phase, and in 1 case an atrophic endometrium. In no case was there a secretory phase. The ovaries showed in 10 cases multiple cystic follicles, in 3 a luteinized follicular cyst together with other cystic follicles, in 4 cases only atretic follicles, some being cystic, together with fibrothecal masses, in 2 cases a recent corpus luteum together with follicular cysts, in 2 a haematoma of the corpus luteum in polycystic ovaries, and in 1 case a thecal-celled tumour.

156. X-ray Irradiation to Promote Ovulation.

By J. O. Haman. West. J. Surg., 55, 107-113, Feb. 1947. 3 figs., 10 refs.

Since the introduction of X-ray irradiation of pituitary and ovaries to treat secondary amenorrhoea by van de Velde in 1914 enthusiastic advocacy
of the method has vied with hearty condemnation.
The main objections were: (1) possible harm, such
as production of permanent amenorrhoea; (2) production in many animals of abnormalities in the
second and third generations by X-ray treatment.
A search of the literature has not disclosed harm to
patient or offspring from properly used low-voltage
irradiation. The author therefore contends that the
above objections are speculative.

Treatment should be preceded by pelvic examination and a pregnancy diagnosis test unless the patient had menstruated in the preceding 2 weeks. Basal body temperature records should show lack ovulation. The mechanism of the therapy is not understood. No cytological changes have been shown in the ovary or pituitary. The first 11 cases treated by the author received X-rays by the Edeiken technique—that is, 135 kV, 5 mA, at 40 cm. distance with 6 mm. of aluminium filtration through an anterior pelvic field of 20 × 20 cm., a similar dosage being given to the pituitary simultaneously through a portal of 3 × 3 cm. The remaining patients were treated alternately with a slight modification.

Treatment resulted in restoration of normal menstruation, as shown by basal body temperature curves and/or biopsy in 71 per cent of 32 cases of secondary amenorrhoea. The percentage of cures was inversely proportional to the length of amenorrhoea, the average in the series being 6 months. Pregnancy followed in 12 women out of 18 who complained of sterility and amenorrhoea; all the offspring were normal. The author concludes that X-ray irradiation appears to be the most effective and economical treatment of secondary amenorrhoea with its accompanying sterility.

In the discussion of the paper Rubin reported similar experience of his own and of Kaplan. Oligomenorrhoea and amenorrhoea suggested lowered fertility, and statistical study of 1,000 cases with these symptoms showed 4 to 6 per cent of spontaneous pregnancies. He stressed the importance of ensuring that the patient was not pregnant before treatment, and stated that irradiation of a pregnant uterus in the early weeks of gestation results in production of a monstrosity in 90 per cent of cases. He quoted the work of Frank on some 150 to 200 cases in which he used X-ray therapy to induce abortion, in every case with a successful result.

C. W. Kimbell

157. Menorrhagia Associated with Irregular Shedding of the Endometrium. A Clinical and Experimental Study.

By E. G. HOLMSTROM. Amer. J. Obstet. Gynec., 53, 727-748, May 1947. 21 figs., 24 refs.

The literature on "irregular shedding" is reviewed. This condition has been referred to as "delayed shedding of the endometrium". Several investigators do not regard it as a separate clinicopathological entity. A brief account of the normal histology of menstruation is given, and it is pointed out that shedding of the endometrium is completed by the second or third day, regeneration of surface epithelium beginning at once and being complete by the fifth day. The diagnosis of the pathological condition described in this paper is based on the findings of progestational endometrium in curettings taken on the fifth day of menstrual bleeding in a case of functional menorrhagia.

Uterine curettage was carried out in 242 cases during 3 years, and of these, 22 cases were said to show irregular shedding of the endometrium. Eleven patients were in the third decade of life, 8 in the fourth decade, and the remaining 3 over 40 years old. Twenty patients were parous and 2 nulliparous [the degree of parity is not given in detail]. Bleeding in 70 per cent of the cases lasted for 10 to 15 days; only 1 patient bled for longer than 15 days. The length of the menstrual cycle was less than 25 days in 4 cases, 25 to 30 days in 11 cases, and over 30 days in 7 cases. Three cases are described in detail. In the first, delayed shedding was observed in two pre-operative endometrial biopsies, and at operation (subtotal hysterectomy and removal of left ovarian cyst-a cystic follicle) the same condition was found with scattered areas of adenomyosis in the uterine wall. The second patient was dealt with in the same way except that between a second biopsy and hysterectomy she was given 10,000 units of oestrogenic hormone in oil daily for 9 days; this, however, failed to have any effect on the onset or extent of the bleeding. In case 3, curettage was performed twice before hysterectomy was undertaken. In all these cases the clinical history was one of regularly occurring menorrhagia.following a pregnaucy, before which menstruation had been normal; and in all of them curettage had no effect on symptoms. Five more cases are described in brief; photomicrographs of the endometrium obtained on the fifth day of loss show retention of secretory epithelium.

The author discusses the aetiology of the condition and obvious pathological lesions such as polypi, submucous myomata, and subinvolution are mentioned. A group of cases remains in which there must be either a prolongation of the effect of progesterone or an interference with the normal mechanism of shedding in the endometrium itself. Four cases are described in which an attempt was made to produce the disease by administration of progesterone; 20 mg. of progesterone in oil daily during the bleeding reproduced the disease, and 10 mg. of progesterone in oil daily in the premenstrual phase delayed the onset of the bleeding, while 20 mg. daily in the premenstrual phase postponed it indefinitely. The authors found no benefit from

repeated curettage and have had recourse to hysterectomy in the younger patients and irradiation sterilization in the menopausal cases. Hormone therapy has not yet been fully tried out.

Hugh R. Arthur

158. Preliminary Clinical Report on a New Synthetic Estrogen Meprane.

By S. H. Sturgis. Amer. J. Obstet. Gynec., 53,

678-681, Apr. 1947. 1 ref.

The clinical effect, therapeutic dose, oestrogenic potency, and toxicity of the synthetic oestrogen "meprane" 3,4-bis-(m-methyl-p-propionoxyphenyl) in patients with the menopausal syndrome are reported. The author selected 34 consecutive patients who complained of typical menopausal symptoms after excision of both ovaries; he thus avoided confusion due to residual ovarian function. The interval from the castration operation until treatment began varied from less than 3 months (15) to 5 to 9 years (3). The age incidence varied from 25 to 29 years (4) to 55 to 59 years (1). The majority (23) were between 40 and 54 years. A control vaginal smear was examined.

An initial dose of 3 mg. daily of meprane was prescribed for 4 weeks. Apart from a small dose of phenobarbitone given to 2 patients other drugs were not used. On the patient's second visit another smear was taken and the clinical effect of the previous dose evaluated. If symptoms were almost relieved a daily 2-mg. maintenance dose was prescribed for the second month after a 10-day interval without medication. If the initial dose had given only partial relief 6 mg. daily was given for a shorter period of 2 weeks. The drug gave effective relief in 30 of the 34 patients. It was later considered that the remaining 4 patients should never have been selected for oestrogen therapy. For the menopausal syndrome 2 to 3 mg. daily was the optimum dose. Meprane appeared to be remarkably free from toxic reactions in doses of up to 6 mg. daily for 2 weeks.

Anthony W. Purdie

159. Haemorrhagic Glandulocystic Hypertrophy Provoked by Implantation of 100 mg. of Folliculin. (Syndrome hémorragique d'H.-G.-K. provoqué par l'implantation de 100 mgr. de folliculine.)

By R. Bourg and R. V. Driessche. Brux. méd.,

27, 879-888, Apr. 20, 1947. 12 refs.

Natural and synthetic oestrogens are in common use for the relief of menopausal symptoms. They are generally administered either orally or parenterally. An attempt to treat these symptoms by the implantation of a compressed tablet of 100 mg. of diethylstilboestrol is described. Three types of patient were subjected to such an implantation:

(I) those who had had a bilateral oöphorectomy with conservation of the uterus; (2) those who had severe menopausal symptoms; (3) those who were past the menopause but had developed kraurosis

vulvae. The compressed tablet was implanted either under the sheath of the rectus abdominis or in the subcutaneous tissue of the thigh, outside the fascia lata. In all cases (32 patients) there were no signs of local irritation at any time. Between the tenth and fifteenth day after implantation the "signs of the tablet" occurred—a feeling of tiredness being associated with lumbar pain, heavy feeling in the lower abdomen, and tense breasts. Two to 3 months later a vaginal discharge appeared, mucous at first but later blood-stained and finally frankly haemorrhagic. Uterine curettage patients) showed "glandulo-cystic hypertrophy". Administration of progesterone and of testosterone did not control the uterine haemorrhage, and the implanted tablet had to be removed in all cases, despite the amelioration of the original symptoms (which then gradually returned). The author concludes that it is not practicable to use implantation of oestrogens as a form of therapy.

Nicolas Tereshchenko

160. Radium Therapy of Menopausal Uterine Bleeding. (La radiumterapia nelle metrorragie del climaterio.)

By F. CRAINZ. Riv. ital. Ginec., 29, 163-258,

1946. 2 figs., bibliography.

The author describes his experience of the use of radium for menopausal haemorrhage in 139 cases collected between the years 1939 and 1944, and gives a review of the very large literature on the subject. His patients were aged 41 to 55; 10 per cent were nulliparae. The most common histological lesion was a cystic glandular hyperplasia of the endometrium. The radium was contained in tubes with a filter of 1 mm. of platinum. Tubes contained 10 or 20 mg. of radium element. The dose varied between 3,000 and 4,000 mg. hours.

The results of the follow-up of 137 out of the 139 cases are given. The radium application had a satisfactory haemostatic effect in all cases, though in 1 patient it was necessary to give a second dose of radium 25 months after the first. Of the series, 8.8 per cent had I loss of blood after treatment, 3.7 per cent had 2, and 2.9 per cent had 3 or more up to a maximum of 5. Menopausal disturbances were experienced by 83.9 per cent of patients. Other symptoms complained of included a watery or mucoid vaginal discharge, hypogastric pain, and transient bladder symptoms. The author claims that his results are good, with minimal morbidity and no mortality, and compare very favourably with those of other methods of treatment of menopausal haemorrhage. He discusses the various methods of medical treatment—hormonal, vitamin, and others. He also describes physical methods designed to destroy the endometrium, such as diathermy coagulation, atomization, and the use of caustic chemicals. He concludes that these methods are often ineffective and carry a danger of infection which may spread outside the pelvic organs. With operative methods a longer stay in hospital is necessary and mortality and morbidity are higher.

Discussing radiotherapy, the author deals first with the induction of an artificial menopause by means of X-rays. Amenorrhoea is almost invariably induced by this means. Mortality is negligible, although a case report exists of a patient who died of embolism while undergoing X-ray treatment. Many patients complained of menopausal symptoms which seemed to be intermediate in severity between those of bilateral oöphorectomy and those of the natural menopause.

The technique of application of radium to create an artificial menopause is also described. Screenage consists of 1 mm. of platinum, 1 to 2 mm. of lead or gold, or 2.3 mm. of silver or other metals. Rubber is superimposed to eliminate secondary irradiation. Dosage used by individual authors varies greatly, from 300 mg. hours to 4,000 mg. hours. The average dose seems to be about 2,000 ing. hours. It may be increased if the uterus is bulky. The radium should remain in situ 24 to 48, or at the most 72, hours. The chief contra-indication is active inflammation in the pelvic organs. Mortality is negligible (about 0.1 per cent). The author reviews literature dealing with the results and complications of the radium menopause. The author concludes that the risk of its predisposing to uterine carcinoma is slight and that radiotherapy may even prevent carcinoma of the cervix by causing the disappearance of cervical erosions. Very few observations exist on carcinoma of the ovaries following radium treatment. It is considered that practical experience of the method has justified its use and proved its value.

Josephine Barnes

161. A Preliminary Evaluation of Dienestrol in the Menopause.

By R. S. FINKLER and S. BECKER. Amer. J. Obstet. Gynec., 53, 513-519, Mar. 1947. 4 figs., 14 refs.

Dienoestrol in doses of from 0.2 to 1.5 mg. daily was administered to 73 patients who complained of menopausal symptoms. The majority of these women (58.9 per cent) had undergone a spontaneous menopause; in others it had followed hysterectomy, castration, or irradiation. Dosage was assessed by the relief of symptoms, and was checked by vaginal smear. Symptoms were relieved in 99.5 per cent. The remainder of the patients were suffering, in addition, from intercurrent disease (mental depression, alopecia areata, or psychoneurosis). Some patients had previously received other oestrogenic therapy without benefit. Only 2 of them suffered from withdrawal bleeding, and in both it was mild. Three patients complained of nausea. initial relief of symptoms the maintenance dose of 0.3 mg. was usually sufficient—the drug being gradually discontinued later.

D. M. Stern

162. Clinical Application of the Sex Hormones in Gynecology.

By H. H. THOMAS. J. med. Ass. Alabama, 17, 134-136, Oct. 1947. 8 refs.

163. The Practical Applications of Hormone Therapy in Gynaecology.

By P. M. F. BISHOP. Canad. med. Ass. J., 57, 353-357, Oct. 1947. 1 fig.

164. Hormone Therapy in Gynaccology. (Hormontherapie in der Gynäkologie.)

By R. WENNER. Schweiz. med. Wschr., 77, 1075-1078, Oct. 4, 1947. 3 figs.

165. Recent Observations on the Diagnosis and Treatment of Menstrual Disturbances of an Endocrine Nature. (Aquisições recentes sôbre o diagnóstico e tratamento dos distúrbios menstruais de natureza endócrina.)

By A. Z. Flosi. Bol. Sanat. S. Lucas., 9, 19-23, Aug. 1947.

166. Prostigmin in Amenorrhoea Observed during Anti-syphilitic Treatment. (Prostigmine dans les amenorrhées observées au cours du traitement anti-syphilitique (reflexions sur le test de non-grossesse de Soskin).)

By L. Marceron. Sem. Hôp., Paris, 23, 2310-2311, Oct. 14, 1947. 7 refs.

167. Simultaneous Use of Female Sex Hormones and Emmenagogues in Menstrual Disturbances. (Gleichzeitige Verwendung von weiblichen Sexualhormonen und Emmenagogen bei Menstruationsstörungen.)

By G. Kese. Wien. med. Wschr., 97, 451-453, Oct. 18, 1947. 9 refs.

168. Therapeutic Effect of Diethylstilboestrol in Aqueous Suspension. (Communicación sobre la acción terapéutica del dietilestilbestrol en suspension acuosa.)

By W. Kock and E. Aguayo. Bol. Soc. Chil. Obstet. Ginec., 12, 49-54, May 1947. 7 refs.

169. Presacral Neurectomy in Treatment of Primary Dysmenorrhea.

By L. PATRICELLI. Northwest. Med., 46, 677-680, Sept. 1947. 5 refs.

170. Treatment of Functional Uterine Haemorrhage. (Traitement des hémorragies utérines fonctionnelles.)

By J. GRIGNON. Union med. Canada, 76, 1067-1070, Sept. 1947. 6 refs.

171. Uterine Haemorrhage due to Gynecological Infections and Benign Tumours. (Les hémorragies utérines par infection et tumeurs bénignes d'ordre gynécologique.)

By G. GAUTHIER. Union med. Canada, 76, 1062-

1066, Sept. 1947. 6 refs.

172. Intraperitoneal Haemorrhage of Ovarian Origin. (Hemorragias intraperitoneales de origen ovarico.)

By D. Lozano. Rev. Asoc. méd. argent., 61, 629-632, Aug. 30, 1947. 28 refs.

173. Uterine Retroversion and Retroflexion in Relation to Sterility. (Retroversione e retroflessione uterina in rapporto con la sterilità.)

By T. Nobile and V. Svrljuga. Ginecologia, Torino, 13, 159-181, Apr. 1947. 47 refs.

Hysteropexy was performed on roo patients selected from a large number with uterine retroversion and retroflexion. The investigation was completed in 47 cases only, the remainder not being traced. Although this is not a large series the results obtained are promising enough to give a useful estimate of the importance of uterine retroversion as a cause of morbidity and sterility, the latter being the main reason for operation.

The husband's semen was examined, and a full gynaecological examination of the woman, including salpingography when necessary, was carried out. Pain, menorrhagia, and leucorrhoea were complained of by 54 per cent of patients. More often dysmenorrhoea was reported. In severe uterine retroversion disturbances of micturition were frequent. Constipation was common in all cases. There were no symptoms, except for sterility, in 30 per cent of patients. Five women had unilateral tubal occlusion and uterine retroversion; in these, hysteropexy was attempted and although the position was corrected pregnancy did not ensue in these patients. Uterine retroversion is not always a cause of primary sterility, but the author considers that displacement of the uterus lessens the chance of the semen finding its way into the cervix. Uterine retroversion was the cause of secondary sterility in 17 per cent of the patients. Eight women had been pregnant before and became sterile without an ascertainable cause. In Piedmont, where women are often engaged in heavy work, uterine retroversion is frequently found after pregnancy; this is due to the fact that they resume their activities before involution is completed and the ligaments have regained their normal tone. Miotti found retroversion and subsequent secondary sterility in 33 per cent of women engaged in such occupations. The patients treated had been sterile for periods of from 2 to 6 years. In 1 case after 16 years' sterility hysteropexy was followed by pregnancy.

The mechanism of the production of sterility in uterine retroversion is not known. The biological modification in the tissues may be a cause or a result of the retroversion. The organs often return to normal after operation and, with the relief of circulatory stasis or pressure, the cells of the uterus, endometrium, tubes, and ovaries regain their physiological powers. This process is not always rapid and delay in pregnancy must be expected; sometimes the retroversion has caused such severe damage and permanent congestion that surgical replacement cannot bring the tissues back to normal.

In general, the results were very satisfactory. Fourteen women (30 per cent) had a successful

pregnancy; another was pregnant at the time of the report; 4 had abortions because of uterine hypoplasia. Follow-up demonstrated that the correction was permanent, even after confinement. Recurrent retroversion of the uterus was uncommon; only one case was reported after delivery. Hysteropexy was performed by Cova's method, the uterus being straightened into an almost physiological position, thus permitting normal development if pregnancy occurred. The prevesical peritoneum is allowed an exceptional mobility and for this reason the uterus returns to normal after confinement.

Rina Saunders

174. Possibility of Specific Inhibition of Human Testicular Mucinase by Female Blood Serum in Relation to some Cases of Sterility. (Sulla possibilità della specifica inibizione della mesomucinasi testicolare umana per effetto del siero di sangue di donna in rapporto ad alcuni casi di sterilità.)

By G. FAVILLI and M. CAMPANI. Riv. ital. Gmec., 29, 259-266, 1946. 14 refs.

Observations are quoted on the testicular mucinolytic enzyme, mesomucinase, and its importance in relation to sterility. Mesomucinase must be present in adequate quantity for fertilization to take place. It is possible to produce an anti-mesomucinase, and it is suggested that such a body may be present in the serum of the woman and that sterility may result from inhibition of testicular mesomucinase. The authors studied 30 sera, 18 from women and 12 from men. Human testicular mesomucinase was obtained from the testicles of male cadavers. A solution of glycoprotein was prepared from umbilical cords. The amount of mucinolysis was estimated by viscosity tests on the glycoprotein solution. It was found that the sera of men and women inhibited the glycolytic activity of testicular mesomucinase to about an equal degree.

The authors suggest that in certain cases of sterility there may be a deficiency of testicular mesomucinase, combined with the presence in the female genital tract of specific antibodies against this enzyme.

Josephine Barnes

175. Seminal Fluid Acid Phosphatase in Sterility. By G. E. Delroy. *Brit. med. J.*, 1, 566-567, Apr. 26, 1947. 9 refs.

The presence of large quantities of acid phosphatase in seminal fluid and in malignant tumours of the prostate gland raises the question of the function of this enzyme. The hypothesis on which this investigation is based is that this enzyme is concerned with the motility of spermatozoa. This is supported by the fact that acid phosphatase is not present in the prostate gland before puberty, although it appears in the rhesus monkey after injection of testosterone.

The acid phosphatase content of the semen of 36

patients, who attended hospital for advice because of sterile marriages was measured and correlated with the pH volume, abundance, motility, and morphology of the spermatozoa. The phosphatase was estimated by the method described in a previous article, no serious diminution in enzyme content within 48 hours of collection being noted. There was no relation between the acid phosphatase content of the seminal fluid and either the motility or the abundance of the spermatozoa, nor was there evidence that acid phosphatase was constantly low in male sterility.

The author is unable to confirm Gutman and Gutman's hypothesis that acid phosphatase is responsible for spermatozoal motility. He notes that MacLeod states that the metabolism of human spermatozoa is almost entirely glycolytic, that Mann found that d-fructose was the reducing sugar present in seminal fluid, and that the acid phosphatase supplied the readily glycolyzable fluid. Lundquist concluded that phosphatase split phosphorylcholine into choline and inorganic phosphate. Lardy and Philips showed that in stored seminal fluid there is an increase in ester phosphorus at the expense of lipoid phosphorus and suggested that the fatty acid produced is then oxidized to provide energy for spermatozoal motility. The author was unable to demonstrate the presence of lecithinase in samples of seminal fluid. He concludes that the function of acid phosphatase is still unknown.

J. Semple

176. A Rapid Supra-vital Staining Method for Assessing the Viability of Human Spermatozoa.

By A. C. CROOKE and A. M. MANDL. Nature, Lond., 159, 749, May 31, 1947. 1 ref.

The authors describe a method of assessing viability of human spermatozoa, based on that to be published by Emmens. Four or 5 drops of seminal fluid are well mixed with I drop of the supravital stain (50 ml. distilled water + 1 g. "revector soluble blue 706"+1.5 g. glucose+0.1 g. sodium chloride + 0.3 g. disodium hydrogen phosphate, hydrated + 0.005 g. potassium dihydrogen phosphate, anhydrous; the solution must be freshly prepared or made up in 1,ml. ampoules and autoclaved). The mixture is left for 2 to 3 minutes. The spermatozoa remain motile in this stain as long as they do in seminal fluid. A smear made from one drop of the mixture is dried in air and fixed in alcoholic mercuric chloride (half volume of saturated HgCl<sub>2</sub> in distilled water + half volume of absolute alcohol) for 15 to 20 seconds, dipped into alcoholic iodine (90 per cent alcohol containing enough iodine in potassium iodide to make a strawcoloured solution) and then into 90 per cent alcohol and allowed to dry. It is counterstained with 1 per cent neutral red in distilled water for 15 to 30 seconds and differentiated carefully in 90 per cent alcohol. The smear may then be examined directly

by oil immersion or passed through absolute alcohol and mounted in Canada balsam.

The nuclei of dead spermatozoa stain blue or purple, while those of living spermatozoa are clear red.

Peter C. Williams

177. The Effect of Roentgen Rays and Exposure to Radium on Fertility.

By C. E. Dunlap. Hum. Fertil., 12, 33-39, June, 1947. Bibliography.

178. The Treatment of Sterility in the Female.

By L. J. GLOBER. Sth. med. J., 40, 865-868, Oct. 1947.

179. Diagnostic Procedures in the Investigation of Sterility in the Female: Evaluation of their Clinical Importance.

By I. C. Rubin. Bull. N.Y. Acad. Mcd., 23, 519-532, Sept. 1947. 1 ref.

180. Three Cases of Sterility Cured by Plastic Operation on the Tubes. (Sobre tres cases de estere-lidade curados com plástica das trompas.)

By L. M. MACHADO. Rev. Ginec. Obstet., 2, 624-626, Aug. 1947.

Infections of the Reproductive Organs.

181. A New Method of Transvaginal Dehydration and Decongestion of Chronic Utero-salpingo-ovarian Inflammatory Masses. (Nouvelle méthode thérapeutique pour provoquer à travers la muqueuse vaginale une déshydration très intense et une décongestion des infiltrations phiegmoneuses chroniques utéro-salpingo-ovarieunes.)

By D. Theodinides. Brux. méd., 27, 1153-1156,

May 25, 1947. 1 fig.

A new method of treatment of chronic inflammatory conditions inside the pelvis by means of dehydrating vaginal tampons is described. The author considers that this treatment is suitable. only in chronic inflammations and should never be used in acute or subacute conditions. The prepara-tion of the tampons is described. Wide-meshed gauze, 20 to 25 cm., is spread in an enamel basin; 30 to 35 g. of crystalline sodium sulphate (Na So. + 10H2O must be used, and not anliydrous sodium sulphate) is mixed on the gauze with liquid paraffin until a thick paste is formed. This paste is wrapped in the gauze, so that a tampou 7 to 8 cm. long is formed, which is then introduced into the posterior fornix of the vagina through a speculum. · Tampons must be freshly prepared before each introduction. They must not be applied more than 3 times a week, nor should more than 12 tampons be used in a month. Treatment continues on the average for 6 weeks to 3 months. If necessary, methyl salicylate and for tincture of iodine may be added to the paste. Since 1930 the author has treated 52 cases in this manner with excellent results and no recurrences.

Nicolas Tereshchenko

182. The Nutrition of Protozoa. I. A Simplified Medium for the Investigation of Unknown Factors in Blood-Serum Essential for the Sustained Growth of Trichomonas vaginalis.

By H. Sprince and A. B. Kupferberg. J. Bact.,

53, 435-439, Apr. 1947. 6 refs.

Most media suitable for the cultivation of parasitic protozoa contain blood serum, but very little is known about the growth factors for these organisms contained in serum. With a view to testing the effect of various fractions of serum upon the growth in vitro of Trichomonas vaginalis, the authors have devised a medium which can be prepared in a minimum of time, which is complete as regards serum or its fractions, and the composition of which is chemically well defined.

The composition of this medium, known as "trypticase nutrient medium" and representing a modification of Johnson and Trussell's medium, is as follows: trypticase 200 mg.; sodium acetate +3H<sub>2</sub>O, 48 mg.; cysteine hydrochloride, 15 mg.; maltose, 10 mg.; "difco" agar, 10 mg.; NaCHO<sub>3</sub>, 5 mg.; asparagine, 2 mg.; ascorbic acid, 1,000µg.; choline chloride, 80 µg.; inositol, 80 µg.; ribose, 40 μg.; adenine sulphate, 40 μg.; guanine hydrochloride, 40 µg.; xanthine, 40 µg.; uracil, 40  $\mu$ g.; riboflavine, 8  $\mu$ g.; thiamine hydrochloride, 1.6  $\mu$ g.; pyridoxine hydrochloride, 6.4  $\mu$ g.; pyridoxamine hydrochloride, 1.6 µg.; pyridoxal hydrochloride, 1.6 µg.; calcium pantothenate, 3.2 μg.; nicotinic acid, 3.2 μg.; p-aminobenzoic acid, 1.6  $\mu$ g.; biotin, 0.8  $\mu$ g.; folic acid, 0.8  $\mu$ g.; methylene blue (optional), 24 µg.; adjusted to pH 6.0 and with Ringer's solution added to make 8 ml.; to this is added 2 ml. of human blood serum diluted with an equal volume of Ringer's solution, giving a final volume of 10 ml. In this medium T. vaginalis has been grown readily through 60 transfers, producing mobile flagellates uniform in size and shape.

For the assay of serum fractions the intact serum in the medium is replaced by any given fraction or combination of fractions by adding 2 ml. of the material to be tested to 8 ml. of trypticase basal medium. When less than 2 ml. is used, Ringer's solution is added to compensate for the difference, since the final volume of each tube should be 10 ml. to permit a comparison of cell counts in the tests and intact serum controls.

C. A. Hoare

183. A New Classification of Genitoperitoneal Tuberculosis including a Pseudotyphoid Form. (Forma pseudotifica y nueva ordenación de las formas de tuberculosis genitoperitoneal.)

By V. CONILL MONTOBBIO. Rev. esp. Obstet. Ginec., 5, 219-221, Oct. 1946.

After reviewing the classical forms of genital tuberculosis in the female, and in particular a mild chronic form characterized by sterility and menstrual irregularities, in which sclero-cystic changes may be found in the ovary, the author

describes in detail a "pseudotyphoid" form which he has encountered. This occurs in young patients, not necessarily sterile, and without any history of pelvic infection, who have a temperature of about 40°C., together with distension and abdominal discomfort. Typhoid fever may be suspected, especially in the seasons when this is common, although the stupor, gastro-intestinal upset, and bradycardia of this disease are little evident. After some days of persistent fever a mass is found in the lower abdomen which varies in size and position from day to day. The acute stage in favourable cases lasts for 3 to 6 weeks, and gives place to a tuberculous adnexal infection which generally progresses to a cure. In the author's opinion this form is due to secondary infection of a tuberculous lesion with intestinal organisms; in one case which drained spontaneously through the pouch of Douglas a pure culture of enterococci was obtained. As the result of the fatal outcome in this case and also in another one, the author expresses disagreement with the opinion of Krönig that genital tuberculosis is not a fatal disease.

The following clinical and anatomical classification of genito-peritoneal tuberculosis is suggested: (1) A chronic form of adnexal infection, which is very mild and is more readily suspected than diagnosed. (2) Diffuse miliary tuberculosus peritonitis with ascites and only slight changes in the appendages. (3) Tuberculous salpingo-oöphoritis. This is the most common type and occurs in 20 per cent of all adnexal infections. It is found in 3 forms; in increasing order of severity these are the nodular, the hypertrophic, and the ulcero-caseous varieties. (4) Tuberculous pelvic peritonitis. In this the adnexal lesions are important, and the neighbouring organs are involved, but progress on the whole is good. (5) The pseudotyphoid form, which is the most serious of all. (6) Tuberculosis of the lower genital tract. Endometrial infection is nearly always found with the previous forms. The cervical variety is rare, and the vulval form extremely rare.

Bryan Williams

184. Isolated Ovarian Abscess. Its Diagnosis and Treatment. (Der isolierte Ovarialabszess [Diagnose und Therapie.])

By G. A. WAGNER. Zbl. Gynäk., 69, 209-218,

1947. 2 re.s.

While the commonest complication of salpingitis is infection of a follicle, an isolated abscess of the ovary with a healthy tube is very seldom seen. The mode of infection is either by the lymphatics (after intrauterine operations or abortion, or during menstruation) or by the blood stream from some focus elsewhere, such as an infected tonsil.

The author believes that an isolated abscess may arise in a recent corpus luteum. The responsible organism is most commonly a haemolytic streptococcus, but may be a staphylococcus, Bacterium coli, pneumococcus, or rarely in anaerobe. Chronic

abscesses may be found, yielding a sterile pus. A solitary abscess commonly produces a spherical tumour up to the size of a foetal head and is seldom associated with marked adhesions. The wall is thin and liable to rupture; the mortality from rupture is very high, particularly in pregnancy and the puerperium. Rupture into a neighbouring organ may occur. The symptoms are not particularly characteristic, but persistent pyrexia, increasing cachexia, and anaemia are suggestive. There is no characteristic blood count, so that the absence of leucocytosis should not exclude the possibility of an isolated ovarian abscess. The reason for this is not clear; possibly the corpus luteum, so frequently the site of a metastatic abscess, has some special protective arrangement of lymphatics. It is noted that the corpus luteum is the most short lived of all the endocrine glands, has an immense activity, and shows marked rapidity of change.

As an aid to diagnosis, vaginal puncture is valuable and enables the bacteriology to be established before operation. It also reduces the risk of rupture of the abscess into the peritoneal cavity or adjacent organs, and frequently leads to general improvement in the patient's condition. If the infection is due to an anacrobic streptococcus the cavity may be washed out with hydrogen peroxide. The absence of tenderness of the tube, always present in salpingitis, is said to be diagnostic of localized abscess, although the differential diagnosis is usually difficult. Drainage of the abscess vaginally will rarely result in complete healing. Laparotomy should, therefore, always be performed. Whether penicillin or streptomycin administration will obviate the need for operation is not known; sulphonamides are usually given too late to prevent pus formation.

E. D. Y. Grasby

185. An Improved Method of Obtaining Material from the Corpus Uteri for Bacteriological Examination,

By A. V. Bartels and S. G. Yuryevsky. Akush, Ginek. No. 4, 55-56, 1947. 1 fig.

186. Actinomycosis 'of the Internal Female Genitalia. Report of Two Cases.

By E. M. BAKER. West. J. Surg., 55, 501-507. Sept. 1947. 12 figs., 5 refs.

187. Gonorrhoea in Pregnancy.

By H. Peters. Amer. J. Obstet. Gynec., 54, 517-522, Sept. 1947. 1 fig., 12 refs.

188. New Data on the Penicillin Treatment of Gonorrhoea in Women.

By Z.Z. Pevzner. Akush. Ginek. No. 3, 26-29, 1947.

New Growths of the Reproductive Organs.

189. Malignant Epithelial New Growths of the Female External Genital Organs. (Neoplasias epiteli-

ales malignas de los órganos genitales externos de la mujer.)

By J. R. L. DE GUEVARA. Toho-ginec. práct., 6, 242-250, Sept. 1947.

190. Gumma of the Vagina.

By W. J. REICH and M. J. NECHTOW. J. Amer. med. Ass., 135, 347-348, Oct. 11, 1947. 2 figs., 4 refs.

191. The Background of Cancer of the Corpus.

By J. Λ. CORSCADEN and S. B. GUSBERG. Amer. J. Obstet. Gynec. 53, 419-431, Mar. 1947. 8 figs., 35 refs.

The factors relating to cancer of the body of the uterus which are considered in this paper are controlled throughout by comparison with those relating to cancer of the cervix. The average age of women with carcinoma of the corpus was found to be 6.6 years higher than that of women with cervical cancer, a difference less than that usually given; the weight of women with corpus cancer was found to be greater by 18 pounds (8.1 kg.), a significant amount although some difference is accounted for by the different average age.

Of 206 women with carcinoma of the corpus 24.8 per cent were unmarried as against 5.6 per cent of 550 women with cancer of the cervix. Of patients with corpus cancer 38.6 per cent had no children as against 16.6 per cent of the women with cervical cancer. Among women with body carcinoma 37 per cent of marriages were infertile. The economic status of women with carcinoma of the corpus is also exceptional, 47 per cent being private patients as against 23.8 per cent of patients with cancer of the cervix. The age incidence of the menopause showed a peak at 52 to 54 years, and the incidence of excessive and irregular bleeding during the cessation of menses was greater than in the general female population.

Some 1,100 women who had been sterilized by radiotherapy because of bleeding due to benign causes were studied for an average of 6.7 years. Nine of 15 cases of cancer of the uterus were in the corpus: 3 times the expected rate. In 31 per cent of cases in which the uterus had been curetted for bleeding during the menopause there was hyperplastic endometrium due to the patient's own endocrine imbalance or to the administration of oestrogenic substances. There was no constant evidence of hyperplasia in the uteri of patients who developed corpus cancer.

It appears, therefore, that cancer of the corpus may develop in unmarried or married and childless women who are overweight and in comfortable circumstances, particularly if the menopause is characterized by excessive bleeding.

[While much has been written about chronic cervicitis as a forerunner of cancer of the cervix, little has been said about the aetiology of cancer of the body of the uterus, and from this point of view this contribution is valuable.]

G. Gordon Lennon

192. Metastases of Uterine Carcinoma to the Central Nervous System. A Clinocopathologic Study.

By T. LIPIN and C. DAVIDSON. Arch. Neurol. Psychiat., Chicago, 57, 186-198, Feb. 1947. 6 figs., 10 refs.

Metastatic tumours in the central nervous system are usually multiple, but it is possible that carcinomata in some organs may give rise to solitary metastases more frequently than do those in other organs. In a series of 26 cases of uterine carcinoma, 70 per cent gave rise to a single metastasis to the nervous system. Metastases of this origin probably account for 1 to 3 per cent of all carcinomata of the central nervous system.

R. M. Stewart

193. Uterine Adenomyosis. Incidence, Symptoms, and Pathology in 1,856 Hysterectomies.

By W. C. Hunter, L. L. Smith, and W. C. Reiner. Amer. J. Obstet. Gynec., 53, 663-668,

Apr. 1947. 7 refs.

Adenomyosis of the uterus is regarded by the authors as the presence of heterotopic endometrium found within the myometrium, derived from the endometrium but often losing such a connection as the process advances. The condition may involve the muscle wall to within a few millimeters of the serosa but does not reach the serosa. Whenever endometrium occurs in the vicinity of smooth muscle there is hypertrophy of the latter.

The authors maintain that adenomyosis of itself gives rise to definite characteristic symptoms even in the absence of any associated uterine disease. The diagnosis was made only when endometrial islands were found in the uterine wall separated from the lining endometrium by a distance of at least two microscopic low-power fields accompanied by muscle hyperplasia. Gross findings, which prompted the tentative diagnosis of adenomyosis (until 'confirmed microscopically), included coarse, whorled, yellowish muscle, punctate pitted areas lying within the myometrium, dark cystic areas which extended to within a few millimetres of the serosa, and eversion of the cut surfaces with rolling of the edges. All features were not present in each case.

The material for the present study was obtained from 1,856 hysterectomies performed for all causes at a private hospital from 1931 to 1945 inclusive. Adenomyosis was found in 517 cases (27.8 per cent). The two youngest subjects were each 27 and the oldest (carcinoma also present) was 73. While most patients were between 41 and 50 years of age, 38 cases were in women under 35. Since adenomyosis occurs so often in association with leiomyoma of the uterus it is difficult to evaluate its symptomatology. For this purpose 110 cases of advanced adenomyosis without associated pathology were chosen. Of these patients, 85 had menorrhagia, 61 dysmenorrhoea, 42 metrorrhagia, 23 pain before periods, 9 dysuria and frequency, 7 pain radiating

down legs, 6 bearing-down sensations, and 5 nausea and vomiting. Nearly all had either some menstrual irregularity or dysmenorrhoea. Bimanually, a globoid, slightly enlarged, and tender uterus was characteristically found. A uterus with leiomyoma and adenomyosis was more tender than one with leiomyoma only.

Anthony W. Purdie

194. Cancer of the Uterus.

By E. Novak. J. Amer. med. Ass., 135, 199-206, Sept. 27, 1947. 33 refs.

195. Symptomatology and Diagnosis of Sarcoma of the Uterus. (Uber die Symptomatologie und Diagnostik des Sarkoma uteri.)

By P. Schrank. Z. Geburts. Gynäk., 127, 232–250, Jan. 1947. 7 figs., bibliography.

196. Cancer Diagnosis by Smears.

By W. A. GROSJEAN. J. Kansas med. Soc., 48, 441-443, Oct. 1947. 4 figs., 12 refs.

197. A Case of Simultaneous Carcinoma of the Corpus and Cervix Uteri. (Su un caso di carcinoma contemporaneo del corpo e del collo.)

By V. GIRARDI. *Ginecologia*, 13, 330-342, July 1947. 6 figs., 20 refs.

198. Regeneration and New Growth at the External Os. (Uber Regeneration and Neoplasie an der Portio.)

By E. GLATTHAAR. Schweiz. Z. Path. Baht., 10, 25-35, 1947. 5 figs., 19 refs.

199. Examination of the Urinary and Lower Intestinal Tracts before Treatment of Carcinoma of the Cervix Uteri.

By L. A. Pomeroy. Amer. J. Roentgenol., 57,

453-454, Apr. 1947. 3 refs.

The findings are reported of intravenous pyelography in 271 patients suffering from carcinoma of the cervix uteri, the X-ray examinations being carried out before the beginning of treatment. As the examinations were made by radiologists at several different hospitals the personal equation made some difference in what was considered abnormal. Cases showing "minimal hydronephrosis" and "minimal hydroureter" were therefore excluded; similarly, cases in which there was slow or diminished excretion of the drug were not reported. Abnormalities were found in 44 cases (16.2 per cent); 3 cases showed double hydronephrosis, 19 single hydronephrosis, 19 functionless kidney, and 3 hydronephrosis on one side and functionless kidney on the other. There did not seem to be any relation between former pregnancies and the abnormal pyelographic findings.

Cystoscopic examinations were carried out on 184 cases, 32 of which showed the bladder wall to be deformed by external pressure of the cervical tumour or by actual invasion, but with a normal mucosa; in 3 cases the mucosa was involved by the tumour. The rectum was examined in many of these

patients (137 proctoscopic examinations and 145 examinations by barium enema). In 2 patients a small non-malignant rectal polyp was found; in 10 patients (all with far advanced tumours) there was some deformity of the rectum or lower sigmoid, due either to pressure from the cervical tumour or to involvement of the wall of the intestine by tumour. In none of the 10 was the mucosa involved.

L. G. Blair

200. Cancer of the Uterine Cervix after Subtotal Hysterectomy. (Le carcinome du col restant après hystérectomie subtotale.)

By G. SAEGESSER. Gynaecologia, Basel, 123,

89-107, Feb. 1947. 38 refs.

The author notes the great variation in statistics of the incidence of carcinoma of the cervix after subtotal hysterectomy. He has studied cases collected at the University Gynaecological Clinic at Geneva between 1930 and 1945, and discusses the frequency of the condition, the latent interval between the operation and the appearance of carcinoma, the relation between the performance of hysterectomy and the appearance of carcinoma, and prophylaxis.

Out of 620 subtotal hysterectomies performed at Geneva the author collected 12 cases of carcinoma of the cervix (1.9 per cent). Clinical details of these cases are given, and the results compared with those of others who give incidences varying from o to 6.09 per cent. Global statistics collected in this way may, however, prove fallacious. The choice: between total and subtotal hysterectomy should depend on the state of the cervix at the time of operation. Total hysterectomy is the more mutilating operation, but must be employed in the presence of cervical lesions. The author states that the incidence of carcinoma of the cervix is less alarming than would appear from recently published figures, and suggests that hormonal disturbances after subtotal hysterectomy may predispose to carcinoma. In view, however, of the extreme frequency of carcinoma of the cervix, its occurrence after subtotal hysterectomy may be regarded as pure coincidence. Evolution in these cases is more rapid than in carcinoma of the cervix with an intact uterus. Treatment is by radiotherapy, but the prognosis is less good than it is in cases where the. uterus is intact. The greater operative risk of total hysterectomy is considered more important than the risk of carcinoma, though the need for careful pre-operative examination of the cervix is stressed.

[The battle between the advocates of total and subtotal hysterectomy has gone on for many years and is often rejoined. On the basis of the present article, one can hardly regard an incidence of 1.9 per cent as insignificant, nor can the occurrence of 12 cases of carcinoma of the cervix, which might have been prevented by a total hysterectomy, be considered negligible.]

Josephine Barnes

201. Treatment of Carcinoma of the Uterine Cervix. Considerations of the Fiftieth Anniversary of the Wertheim Operation.

By F. Buschke and S. T. Cantrill. West J. Surg., 55, 152-161, Mar. 1947. 2 figs., 13 refs.

The good progress achieved in the treatment of cancer of the cervix during the 50 years since Wertheim described his operation now makes it possible to cure a considerable proportion of cases. The proportion would be much increased were optimal treatment available to all women suffering from the disease. The best results are obtained from radiotherapy, and the figures published by Regaud over 10 years ago already show a superiority over surgical treatment. Grouping of cases in stages is necessary for evaluation of results, and the authors follow the classification proposed by the League of Nations Statistical Committee in 1937 (a modification of the old one and not yet in general use). The technique is a modification of the method used by the Fondation Curie, Paris, with the vaginal ovoids developed at the Holt Radium Institute, Manchester. The uterus is usually treated first, and the vagina later; treatment lasts about 2 weeks. X-ray therapy is also given (except in stage 1) from an apparatus operating at 800 kV. and 4 fields. If treatment has to be given at 200 kV, two extra fields are added. The cervix is avoided, and fields vary in size from 10 x 8 to 14 x 10 cm. Radium doses are given in terms of mg. hours and of total dosage to all fields, but Parker's measurement of physical doses is described. He has shown that even for a large pelvis a dose of 4,500 r is obtained at the pelvic wall. The radium dosage is delivered in about 2 weeks, X-ray dosage in about 6 weeks. The care of the patient during treatment is important and reactions are carefully observed. Reaction of the rectum is the most common and most serious complication. A slight immediate reaction can hardly be avoided, but in the more advanced cases of the disease a small proportion of severe late rectal lesions must ensue if there is to be a chance of cure. These usually heal with proper management but occasionally fibrous strictures may require colostomy. There may also be bladder reactions, but these hardly ever assume serious proportions. Other complications, such as fracture of the femoral neck, have not occurred in this series.

The 5-year cure rate obtained was 83 per cent with stage I, 56 per cent in stage II, and 38 per cent in stage III. In 130 cases treated from 1935 to 1940 the relative cure rate was 43 per cent.

Ralston Paterson

202. Carcinoma of the Cervix of Bowenoid Type. (Uber Portiokarzinome von bowenoidem Charakter. [Zugleich ein Beitrag zur Frage der Vergleichbarkeit der Frühstadien des Carcinoma colli uteri mit Bowenscher Krankheit und Erythroplasie].)

By K. PRETL. Krebsarzt, 2, 99-114, Mar. 1947.

r fig., 34 refs.

A biopsy specimen from the cervix uteri of a 35-year-old peasant housewife had the typical appearances of Bowen's disease. Inspection revealed a small area of leucoplakia on the posterior lip of the cervix and a scar in the vaginal vault behind it. Histologically the scar tissue was not unusual, but the other lesion was an erosion of the cervix with cystic glands and lymphocytic and plasma-cell infiltration of the stroma. The surface was covered by squanious epithelium with a thick horny layer and was indented by many long and narrow papillae. The nuclei varied widely in size, staining properties; some were and vacuolated, others rich in chromatin. Some cells were multinucleated ("clumping forms"), and between the cells, especially those of the pricklecell layer, were rounded or oval cells with acidophil hyaline cytoplasm ("grains"). Only a few corps ronds were seen. Mitoses were numerous and often abnormal. This atypical epithelium covered the mouths of the glands and pushed up the simple columnar epithelium in the necks of the glands. In the deeper parts of the glands the appearances were those of an immature squamous carcinoma, without "clumping forms ''. keratinization or keratinizing atypical epithelium covered the whole surface of the specimen and extended to the cut edge; hence no normal epithelium was visible, and no opinion could be formed about the transition from altered to normal epithelium. Although serial sections were examined, there was nowhere any evidence of invasion of the stroma. The lesion as a whole was considered to be a pre-invasive squamous carcinoma of the cervix on a glandular erosion, on the surface showing keratinization and Bowenoid features, but within the glands taking the form of an immature squamous carcinoma. [The description suggests that removal of the growth was incomplete; the possibility that invasion had occurred in parts not examined therefore remains open (the reader is referred on this point to the excellent discussion of Bowen's disease of the cervix in Novak's Gynaecological and Obstetrical Pathology). The rest of the paper is a review of the literature with a special reference to terminology and the aetiology of cancer.] R. Whitehead

203. Carcinoma of the Cervix Uteri and Lymphatic Metastases. (Cáncer cervico uterino y metástasis linfáticas.)

By C. Zuckermann. Rev. mex. Cir. Ginec. Cancer, 15, 219-226, June 1947. 1 fig., 10 refs.

20.1. Cancer Diagnosis by Microscopical Investigation of Smears from the Affected Cervix Uteri.

By A. Y. Altgauzen, G. L. Derman, and O. M. Nosalevich. Akush. Ginek. No. 3, 6-10, 1947.

205. Recurrence and Metastasis after a More Radical Abdominal Operation for Carcinoma of the Cervix Uteri.

By T. B. ALBITSKAYA. Akush. Ginek. No. 3, 11-14, 1947.

206. Contribution to the Early Symptoms of Carcinoma of the Cervix Uteri. (Beitrag zu den Frühsymptomen des Kollumkarzinoms.

By V. GRUENBERGER. Krebsarzt, 2, 387-398, Sept. 1947. 12 figs.

207. Rare Metastasis Formation after Operation on Carcinoma of the Cervix. (Seltene Metastasenbildung nach operiertem Kollumkarzinom.)

By V. GRUENBERGER. *Krebsarzt*, 2, 459-465, Oct. 1947. 4 figs., 1 ref.

208. Relation of "Colposcopically Atypical Epithelium" to Endocervical Cancer and its Treatment. (La relación del "epitelio atípico colposcópico" con el cancer del endocervix y su tratamiento.)

By C. Alba Menendez. Toko-ginec. práct., 6, 213-237, Sept. 1947. 8 figs., 42 refs.

209. Physical aspects of Intracavitary Radium Treatment of Carcinoma of the Cervix Uteri. III. A New Applicator.

By G. J. NEARY. Brit. J. Radiol., 20, 454-469, Nov. 1947. 17 figs., 5 refs.

210. Angiomyoma of the Endometrium. (Ein Angiomyom des Endometriums.)

By O. Schinkle. Wien. klin. Wschr., 59, 617-618, Sept. 19, 1947. I fig.

211. Experimental and Clinical Facts regarding the Use of Artificial Radioactive Isotopes for Localized Radiotherapy. (Données experimentales et cliniques de l'emploi d'isotopes radioactifs artificiels dans un but de radiotherapie localisée.)

By J. H. Muller. Schweiz. med. Wschr., 77,

236-239, Feb. 15, 1947. 8 figs.

The main therapeutic applications of artificially radioactive elements, apart from their use as "tracers", are twofold: (1) oral or intravenous administration, as of radioactive phosphorus ( $P^{32}$ ) or iodine ( $I^{131}$ ), to procure their general distribution through the organism, with a selective accumulation in certain tissues and organs; (2) local application: (a) instead of radium, in the usual "needles" or "applicators"; (b) by local injection and prevention of their diffusion from the place of injection throughout the whole body.

The author has investigated this last "localized" radiotherapeutic method—that is, the direct injection of radioactive elements into a tumour or cavities of the body. With the help of physicists and chemists at Zürich University, a radioactive zinc (Zn<sup>63</sup>) was obtained and made practically "insoluble" by suspending it as the sulphate in a macromolecular sol, pectin, well tolerated by the human body but not absorbed from the site of injection. Zn63 has a half-life of 38.3 minutes, and emits  $\beta$  and  $\gamma$  rays and positrons. A number of experiments on mice and rabbits were first carried out and the insoluble radiozinc was injected into the peritoneal cavity. Autoradiographs and careful Geiger counter measurements showed practically no diffusion of the radioactive substance into the blood

or to distant parts of the body, and histological examination, several hours after injection, showed

an intense local cytolytic effect.

Radiotherapeutic trials were then carried out in 3 patients with generalized peritoneal carcinomatosis and in advanced ovarian carcinoma, all other therapy having failed. The technique was to inject 20 ml. of pectin sol, containing 15 to 40 millicuries of  $Zn^{63}$ ; this injection was repeated 2 to 5 times at intervals of 1 or several weeks. The injections were well tolerated. Autoradiographs and counter measurements of blood, urine, and distant parts of the body again showed practically no absorption of the radiozinc. Photographic  $\gamma$ -ray measurements after 7 hours' exposure, which corresponds roughly to the total duration of radioactivity of the zinc, showed a  $\gamma$ -ray dose of about 0.5 to 2 r.

It is too early to indicate an optimum dose or to assess the therapeutic value of the method, but improvement in the general condition and diminution of ascites was observed and in I case a satisfactory palliative result obtained. In the author's opinion it is worth while to pursue this method. Radiozine might further be used for intratumoral and peritumoral injection in suitable cases, possibly combined with penicillin and also for injection into hollow organs, as in cancer of the

bladder.

II. C. Sim

212. Dysgerminoma Ovarii.

By M. S. MAZEL. Amer. J. Obstet. Gynec., 53,

1036-1041, June 1947. 4 figs., 8 refs.

Some of the literature on dysgerminoma ovarii is reviewed, particular stress being laid on the malignancy of the condition and the need for

radical operation even in young women.

The author reports a new case in a single woman, aged 23. She complained of a frequency of micturition and a rapidly growing mass. There was no disturbance of menstruation or of secondary sex characteristics. A lobulated mass the size of an 8month pregnancy was found arising from the left side of the pelvis, although the abdomen was known to have been normal 2 months previously. At laparotomy much free fluid was found, and firm grey tumour replacing the entire left ovary was removed together with the left tube. A similar mass about the size of a hen's egg was attached to the right ovary and was removed from it. The left pedicle was extremely vascular. There was no involvement of other organs. Both tumours were smoothly encapsulated and their cut surfaces were mottled grey and red and fragmented easily. There was some necrosis and liquefaction in the larger mass. Microscopically the tumours were typical of dysgerminoma with many mitoses. After discussion with the patient and her family, total hysterectomy and right salpingo-oöphorectomy were performed, a month after the first operation. Fibrosis uteri, hyperplasia of the endometrium and of the mucosa

of the Fallopian tube, and haemorrhagic cysts of the ovary were reported, but no malignancy. This was followed by an intensive course of irradiation. Menopausal symptoms were successfully prevented by administration of 10,000 units of "theelin" in oil on alternate days and gr. ½ (32 mg.) phenobarbitone 3 times daily. The patient remains at work and is still symptom-free.

Aileen M. Dickins

213. Meigs's Syndrome; A Case Report and a Review of Recently Published Cases.

H. J. SIMON. Amér. J. Obstet. Gynec., 53, 1042-1048, June 1947. 20 refs.

The author has tabulated the 16 cases of Meigs's syndrome recorded since Meigs's 27 collected cases in 1943 (Meigs et al., Amer. J. Obstet. Gynec., 1943, 46, 19) and has added 1 case of his own. He considers that the term should be limited to cases with a solid tumour of the ovary, ascites, and hydrothorax, but excluding malignant and cystic tumours.

His own patient was remarkable for her presenting symptom—a very large femoral hernia leaking yellow fluid. Her general condition was so poor that laparotomy was thought by some to be unjustifiable, but as the outlook was otherwise hopeless operation was undertaken. From 500 to 750 ml. of clear yellow fluid was removed and a rapid right salpingo-oöphorectomy performed. The tumour was  $26 \times 23 \times 17$  cm. in size, and was macroscopically and microscopically a typical fibroma. Recovery was rapid and complicated only by a distension of the bladder by 1,500 ml. of urine despite a similar output during the previous 24 hours. This diuresis was attributed to rapid resorption of the plenral exudate, which was clinically complete by the fifth day. After 3 months hernia had spontaneously disappeared, although an impulse on coughing persisted. The patient had then regained 25 pounds (11.25 kg.) in weight and returned to work. Eighteen months after operation she was still well.

This case illustrates Meigs's thesis that it is essential to operate however hopeless these cases seem. The author considers that diagnosis of inoperable malignancy are still being made in these cases.

Aileen M. Dickins

214. Granulosa-cell Tumour of the Ovary: A Case Report.

By H. E. H. DENHAM. N.Z. med. J., 46, 320-323, Aug. 1947. 6 refs.

215. Brenner Tumour of the Ovary: Report of Two Cases. One in the wall of a Serous Cystadenoma.

By Y. M. BHENDE. *Indian ined. Gaz.*, 82, 322-326, June 1947. 6 figs., 26 refs.

216. Meigs's Syndrome. (Sindrome de Meigs.) By A. VIEIRA VOLPI. Bol. Soc. Chil. Obstet. Ginec., 12, 38-42, May 1947. 2 figs., 11 refs. 217. Pleurisy with Effusion Associated with Pseudomucinous Cystadenoma (Meigs's Syndrome).

By E. D. Nora and R. M. Davison. *Dis. Chest*, 13, 423-435, Sept.-Oct. 1947. 5 figs., 32 refs.

218, Struma Ovarii.

By C. DE OLIVEIRA. Rev. brasil. Chir., 16, 507-514, Aug. 1947. 4 figs., 18 refs.

219. Arrhenoblastoma with Case Report.

By J. P. HARDY and A. F. TOOLE. J. med. Ass. Alabama, 17, 125–128, Oct. 1947. 13 refs.

220. Granuloma of the Fallopian Tube due to Surgical Glove Talc. Silicious Granuloma.

By G. B. S. ROBERTS. Brit. J. Surg., 34, 417–423,

Apr. 1947. 8 figs., 29 refs.

An account is given of granulomatous lesions (2 in abdominal scars and 5 in Fallopian tubes); the author ascribes the aetiology to talc from surgical gloves. In spite of a latent period of several years (2 to 17) in which the agent appeared to be dormant the lesion when activated (cause unknown) developed within 2 months in 1 case. The silicious nature of the substance deposited, demonstrated in each case with the polarizing microscope, was proved microchemically in only 1 case. Cultures or animal inoculations were not performed so that tuberculosis may have co-existed. Among other clinical features pelvic pain and infertility are mentioned.

[The author rightly questions a diagnosis of tuberculosis made on histological grounds only. But if these granulomata are due to tale the dauger of the continued use of this form of glove powder must again be considered by all surgeons.]

Magnus Hames

221. Malignant Chorionepithelioma of the Fallopian Tube. (Uber das maligne Chorionepitheliom der Tube.)

By W. Loesch. *Krebsarzt*, **2**, 449-459, Oct. 1947. 35 refs.

Operations.

222. The Importance of Adequate Training of the Gynaecologist in both Vaginal and Abdominal Operations. (Die Bedeutung der gleichmassigen Ausbildung des Gynakologen im vaginalen und abdominellen Operieren.)

By H. Kahr. Wien. klm. Wschr., 59, 626-630,

Sept. 26, 1947.

223. Effects of Castration on the Metastases of Cancer of the Breast. (Les effets de la castration sur les métastases du cancer du sein.)

By A. Sicard. *Presse méd.*, 26, 294–295, May 3,

1947.

Eleven cases of ovarian castration performed for advanced metastases from carcinoma of the breast treated primarily by mastectomy are reported. The author claims that castration is the method of choice for relieving the pain of osseous metastases, on the grounds that ovariectomy is simple, devoid of risk, more certain and less disturbing to the patient than morphine administration, radiotherapy, or chordotomy, and relieves pain rapidly, usually within the first 48 hours after operation. He states that root pains and pains radiating to the limbs from spinal metastases are relieved at once. Details of 5 cases are given to illustrate these effects (almost invariably obtained by the author, though he admits that other workers have not been so successful).

In a cachectic woman of 48 with a very painful obturator neuralgia from a radiologically proved sacro-iliac metastasis 10 years after mastectomy, pain completely disappeared 48 hours after ovarian castration, and she regained her appetite and weight in spite of there being no demonstrable change in Ovariectomy relieved size of the metastases. another woman of 42, who had developed headaches and painful metastases in the skin, a rib, and the skull. After 9 months there were no further secondaries, but those already present had not changed in size. A post-menopausal woman of 51, with painful pulmonary, bony, and spinal metastases and developing paraplegia 5 years after mastectomy, was subjected to ovarian castration. On the following day and after 5 months, although her general condition was deteriorating rapidly, she was free from pain. In a woman of 53 with secondaries in the remaining breast, skull, and pelvis, accompanied by severe sciatica and difficulty in walking 5 years after mastectomy, deep X-ray therapy had produced an artificial menopause but pain was intolerable until ovarian castration was performed. A woman of 46 developed painful cutaneous supraclavicular metastases and a brawny arm. Radiotherapy gave no relief. After ovariectomy pain ceased, the arm lesion almost completely resolved, and she gained 5 kg. in weight.

The author concludes that, though it is still too early to forecast the late results, the immediate results are dramatic. He points out that radiotherapy is unreliable in achieving an artificial menopause, that ovarian castration is a more reliable primary measure and more useful secondary measure in relieving pain in cases refractory to X-rays, and that it is equally effective in treating the young and the post-menopausal patient. Testosterone therapy, though experimentally effective in monkeys, failed to control the metastases from carcinoma of the female breast in the 2 cases in which he has tried it.

[Ovarian castration seems to influence the evolution of metastases of carcinoma of the breast, but other workers have not had this uniform success in relieving pain, and castration does not seem to prevent further secondary deposits developing. Much more research in this field is required before definite conclusions can be drawn.]

Charles Nicholas

224. Coelioscopy and the Ovarian Cycle. (Coelioscopic et cycle ovarien.)

By F. DE SENARCLENS. Gynaecologia, Basel, 123.

220-237, Apr. 1947. 59 rcfs.

Coelioscopy dates from 1901, when Kelling used it on dogs. Jacobaeus, in 1910, introduced it for visualization of the human abdominal organs. Palmer, in 1944, opened up a new field by applying it to the study of sterility [in a wide bibliography the author does not refer to the work by Rendle Short in Britain many years ago on its use in abdominal diagnosis]. The advantages of accurate correlation between endometrial findings and observation of the surface appearance of the ovary are obvious. The mortality rate of the procedure in Ruddock's series of 900 cases was 0.2 per cent compared with a laporotomy mortality rate of 6 per cent [the latter figure seems very high].

Coclioscopy is carried out under local analgesia. A pneumoperitoneum is created with a mixture of 95 per cent oxygen and 5 per cent carbon dioxide (5 litres). The patient is placed in the Trendelenburg position, and then a trocar is introduced followed by the coelioscope. Alternatively the pouch of Douglas can be used as a route of approach. There is danger of gas embolism and puncture of the intestine, and the procedure is contra-indicated in patients with a history of previous abdominal operation or inflammatory lesions. Additional biopsy by the instrument needs very careful technique.

The author reports 10 cases in which the ovaries were inspected at the time of expected ovulation. In 7 both ovaries were visualized, in 2 one ovary only could be seen, and in 1 the one ovary and part of the other. The observations checked the date of ovulation and the other results of tests used in such cases (biopsy of the endometrium and hormone excretion tests). It is possible too, that coelioscopy may prove of diagnostic value in cases of menstrual disorders.

[Coelioscopy is one of those methods of examination which undergo phases of use and disuse. Its application in sterility must surely be to the small group of cases where direct proof of ovulation is necessary.]

\*\*Renneth Bowes\*\*

225. Technique of Intra-isthmic Total Hysterectomy. (Technique de l'hystérectomie totale intra-isthmique.)

By C. Elbaz. Presse méd., 17, 194, Mar. 19,

1947. 3 figs., 3 refs.

The relative advantages and disadvantages of total and subtotal hysterectomy are well recognized. One of the disadvantages of the former is the disturbance of the supports of the vaginal vault with the danger of encouraging subsequent prolapse. The technique here described is one which can be applied to non-malignant conditions of the uterus. It consists in removing the epithelium of the cervical canal by coring out the cervix between

the longitudinal and circular fibres. This leaves the ligamentary supports unaffected. It is important that the clamps applied to control the uterine vessels should be applied at a lower level than when a subtotal operation is performed. If this is done there is no danger of haemorrhage. The author states that over 400 such hysterectomies have been done at Hertz's Clinic without any untoward incident, and in no case has prolapse followed.

Kenneth Bowes.

226. Instruments and Technique in Gynaecological Coelioscopy. (Instrumentation et technique de la coelioscopie gynécologique.)

By R. Palmer. Gynéc. Obslét., 46, 420-431, 1947. 1 fig.

227. A Technical Detail in the Downward Prolongation of Peritoneal Incisions without Danger of Injury to the Bladder. (Un particolare di tecnica per prolungare inferiormente l'incisione peritoneale senza pericolo di ledere la vescica.)

By A. Marengo. *Ginecologia*, 13, 343-346, July 1947. 3 figs.

228. Resection of the Nervi Pudendi as a Method of Treatment of Printins of the External Genital Organs. By E. E. GIGOVSKY. Akush. Ginek. No. 3, 29-31, 1947.

229. "Cross-bar" Interposition: A proposed Safeguard against Recurrence in Operation for Complete Prolapse. (Die Querriegel-interposition. Ein Vorschlag zur Sicherung der Operation des Total-prolapses gegen Rezidivc.)

By G. Doederlein. Zbl. Gynäk., 69, 4-9, 1947.

3 figs., 3 refs.

230. The Surgical Treatment of Prolapse of the Vagina and Uterus.

By I. L. Braude. Akush. Giuek. No. 3, 32-41, 1947. 12 figs., 1 rcf.

231. Hysterosalpingography in Gynaecological Diagnosis (A Study Based on 502 Personal Cases). (A histerossalpingograffia no diagnostico ginecológico. [Estudo baseado em 502 casos pessoais].)

By A. CAMPOS DA PAZ FILHO. Med. Cirurg. Farm

No. 136, 420-435, Aug. 1947. 16 figs.

232. The Question of Damage due to Salpingo-

graphy with Iodized Oil. (Zu der Frage von Schädigung bei Salpingographie mit Jodipin.)

By H. S. REICHLE and P. ROETTGER. Zbl. Gynäk., 69, 73-81, 1947. 3 figs., 10 refs.

233. Ambulant Hysterosalpingography? (Ambulante Hysterosalpingographie?)

By K. J. Adler. Zbl. Gynäk., 69, 70-73, 1947. 8 refs.

234. Severe Complications after Hysterosalpingography and Tubal Insufflation. (Zlé komplikace po hysterosalpingografii a pertubaci.)

By V. CHMELIK. Ceskoslov. Gynaek. No. 12/26,

249-260, 1947.

235. Etiology, Prevention and Treatment of Vesicovaginal Fistula.

By V. S. Counseller. *Sth Surg.*, **13**, 752–759, Oct. 1947.

236. Treatment of Incurable Urogenital Fistulae by Implantation of Ureters in the Recto-sigmoid combined with Sulphonamide Therapy. (Tratamento das fistulas uro-genitais incuraveis pela inplantação dos ureteres no retrosigmoide associada à sulfonamidoterapia.)

By W. DE SOUZA RUDGE. Rev. paulist. Med., 31,

1-46, July 1947. 19 figs., bibliography.

237. Treatment of the Uterine Prolapse Syndrome by the Spalding-Richardson Composite Procedure.

By R. C. Austin. Ohio St. med. J., 43, 490-497,

May 1947. 3 figs., 1 ref.

Having found abdominal hysterectomy, vaginal hysterectomy, and interposition and Manchester operations unreliable in the treatment of uterine prolapse and its associated herniations, the author has adopted the "composite" procedure proposed by Spalding (Surg. Gynec. Obstet., 1919, 29, 529) and Richardson (Amer. J. Obstet., 1937, 34, 814).

After dilatation and diagnostic curettage the cervix may be amputated, conized, or left intact as indicated. The vaginal epithelium is separated from the bladder and a layer of prevesical fascia freed. The bladder is pushed upwards from the cervix until the peritoneum is exposed. This is incised and the uterine body brought forward. The tubes and the round and broad ligaments are divided as near the cornua as possible, and supracervical hysterectomy or fundectomy is performed. An enterocele, if present, is repaired at this stage, a finger being inserted over the remaining utero-cervical segment, into the pouch of Douglas, as a guide to its dissection and repair by suture of the utero-sacral ligaments. The upper surface of the utero-cervical stump is then closed, with incorporation of the tubes, ligaments, and blood vessels into its lateral angles. The peritoneum of the uterovesical pouch is sutured to the posterior surface of the stump, rendering the latter extraperitoneal. The anterior repair is completed, a drain being left in the retrofascial space. A modified Ward perineorrhaphy completes the operation. The average time taken is 1 hour 18 minutes. In post-operative management catheterization for residual urine, early ambulation, and the frequent use of sulphonamides are advised.

The author claims that the operation is anatomically sound, restoring organs to their normal positions by the use of the normal supporting structures. He considers a heavy, subinvoluted uterus to be an important contributory cause in many cases of prolapse. In this operation diseased tissues are removed without the disadvantages the author has found from vaginal hysterectomy, such as inadequate bladder support, the possibility of herniation through the sutured broad ligaments, and shortening of the vagina. The operation may

be adapted in scope to treat the individual pathology encountered.

None of the first 84 patients died. Of 79 patients followed up, 73 had anatomically satisfactory results, 2 needed further operation, and 4 had minor defects, 62 were symptom-free, 7 had symptoms due to unrelated conditions, 8 had symptoms for which no cause was found, and in 2 only the complaints were referable to anatomical defects. Of 25 patients originally complaining of varying degrees of incontinence, 20 were completely relieved, 3 improved, 1 was no better, and 1 untraced. The author describes 15 "retarded recoveries" mainly due to local or urinary infections.

[Better diagrams and a more detailed description of the operation and its anatomical basis and results are given in the same author's paper in Surg. Gynec. Obstet., 1946, 83, 725.]

Aileen M. Dickins

Urology.

238. Extravaginal Plastic Repair of the Pelvic Floor for Prolapse of the Bladder Neck. A new Method to Operate for Stress Incontinence. [In English.]

By A. Ingleman-Sundberg. Gynaecologia, Basel, 123, 242-254, Apr. 1947. 10 figs., 42 refs.

At least 20 per cent of routine operations for stress incontinence are unsuccessful. Having been impressed by failure of operations on the connective tissues intended to support the bladder neck, the author has designed a technique to suspend it by muscle tissue. The most characteristic finding in stress incontinence is the way in which the bladder slips between the separated levatores ani. This can be demonstrated radiologically. The technique described is to expose the bladder by vaginal operation and to elevate it from the cervix. The pubocervical ligaments are then sutured under the bladder and cervix. By blunt dissection the muscular tissue of the levatores ani is found laterally, and if sufficiently developed the two muscles are sewn across under the bladder neck region. Colporraphy may be performed in addition if indicated. If the tissues are poorly developed it is better to substitute an interposition operation. A catheter is kept in situ for a week after the operation. Fifteen cases have been treated by this operation, 14 successfully and 1 partially.

Kenneth Bowes

239. Urinary Incontinence Following Childbirth Including Vesico-vaginal Fistulae.

By J. C. Moir. *Edin. med J.*, 54, 368-381, July 1947. 15 figs., 11 refs.

240. Polypus of the Female Urethra. (Acerca de los polipos de la uretra femenina.)

By J. R. CADARSO L. DE GUEVARA. Medicina, Madrid, 15, 138-147, Aug. 1947. 5 figs., 17 refs.

241. Complete Inversion and Total Prolapse of the Bladder through the Urethra. (Inversao complete e prolapso total da bexiga atravez da uretra.)

By A. Nazareth. Rev. Ginec. Obstet., 2, 681-

684, Sept. 1947.

#### Miscellaneous

242. A case of Spontaneous Rupture of the Ovary with Severe Intraperitoneal Haemorrhage. (Spontan ovarialruptur med stor intraperitoneal blodning.)

By A. THOMASSEN. Tidsskr. norske Lægeforen.,

67, 576-578, Nov. 1, 1947. 10 refs.

243. Prolapse of the Cervical Stump after Hyster-

ectomy. (Prolapso del munon del cuello uterino posthysterectomía.)

By R. LOPEZ MONTI. Rev. Asoc. med. argent., 61, 624-629, Aug. 30, 1947. 8 figs., 38 refs.

244. Two New Cases of Volvulus of the Fallopian Tube. (Dos nuevos casos de volvulus salpingiana.)

By C. Zuckermann. Rev. mex. Cir. Ginec. Cancer, 15, 187-193, May 1947. 3 figs., 9 refs.

245. Unusual Cases of Uterine Perforation. (Sonderfälle von Uterusperforation.)

By H. Husslein. Klin. Med., 2, 855-859, Sept. 15, 1947. 2 figs.

#### THE

# Journal of Obstetrics & Gynaecology of the British Empire

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NEW SERIES

APRIL 1948

#### SIR FRANCIS CHAMPNEYS

Born 25th March, 1848

THE centenary of the birth of this great and good servant of womankind has been celebrated in London at the Church of St. Bartholomew's the Great.

Sir Francis Henry Champneys, Bart., M.A., D.M., F.R.C.P., died in 1930 full of honour, having in his long and happy life of devoted labour earned such affection and respect as is rarely given to the successful reformer.

The midwives of this country owe to him their present dignified status as skilled craftswomen; our childbearing women owe to him their care by these fully qualified midwives in place of ignorant handywomen; obstetricians owe to him the provision of these skilled assistants in their work.

One of his other contributions to our art was his support of the founding of the Journal of Obstetrics and Gynaecology of the British Empire. He was one of its first directors and its chairman from 1907 until advancing years prevented his continuing.

And another was his part in the foundation of the Royal College of Obstetricians and Gynaecologists of which he was elected Vice-Patron in gratitude for his services.

A devout Christian, he employed his considerable musical gifts in the service of his Church; several of the tunes for "Hymns Ancient and Modern" were composed by him.

# Relief of Severe Stress Incontinence\* Technique and Anatomy of Two Suprapubic Fascial Operations

BY

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The Women's Hospital, Liverpool.

In presenting this description of two suprapubic operations for the relief of stress incontinence, I do not feel that it lies with me to make any definite or final pronouncement on the subject. Nor have I any desire to detract in even the smallest particular from the service rendered by both Aldridge (1930) and Studdiford (1944, 1945, 1946) to the advancement of our knowledge in this field. Yet, from a limited experience of the Aldridge procedure and from a close study of the patients who have presented themselves, it has been impossible to escape certain doubts or avoid certain conclusions. It will, therefore, perhaps clarify the consideration of this subject if I immediately set down some of those problems to which distinct answers will eventually be required, before any or all of these operations are apportioned their relative and rightful places in the management of this condition.

I. The Aldridge operation seems unnecessarily complicated and involves too much operating. Although to Aldridge the vaginal part of the operation is primarily a reconstructive procedure, there is no doubt that with some another factor might weigh

2. If the vaginal portion of the Aldridge and Studdiford operations is put forward as a reconstructive procedure essential in every case and indispensable to the success of a fascial sling operation, this can be denied from experience alone. A number of patients with severe stress incontinence have been met and successfully treated in whom there has been no localized sagging of the anterior vaginal wall due to urethrocele, cystocele, or both combined. such the anterior vaginal wall has offered to inspection a plane surface throughout its length and there has been no abnormal descent of the uterus when subjected to strain and effort, or when tested with the volsellum. Undoubtedly, insome, the vaginal wall (and bladder neck and urethra) had rotated backwards somewhat and the angle between it and the back of the symphysis had been widened; but even this · condition was perhaps more apparent than real, for a gaping introitus, deficient perineum, and rectocele (all so frequently present) had simply rendered the anterior vaginal wall unusually visible. When, in

should the suprapubic operation prove a real competitor, and that factor is that the vaginal approach to the urethra is familiar, whereas in its encirclement from above there is something of the novel and mysterious.

<sup>\*</sup> Being an expanded version of a communication given to the North of England Obstetrical and Gynaecological Society on 3rd January, 1947.

such cases, these posterior defects are adequately repaired the illusion goes and we are left with a straight and lengthened vagina, the axis of which shows little departure from normal.

- 3. There is a fairly general opinion that all sling operations should be resorted to only when other so-called simpler methods have failed. Certainly this has been the attitude to these operations throughout their long continental history, and it would be perfectly logical if, under modern conditions, the operations presented exceptional difficulties and were fraught with a whole lot of terrifying or even mortal dangers. But this is not so. Their very high percentage of successes when other methods have been tried and have failed is remarkable and quite unquestioned. May it not be presumed that as a primary effort in selected patients the results would be equally successful?
  - 4. The Aldridge operation, the Studdiford operation, the supra- and retropubic methods, are all really revivals of older procedures. Not only will they again compete with each other for the attention of the gynaecologist, but before they can win real acceptance they must also show their superiority to such vaginal plastic operation as those so carefully designed by Kennedy (1937a, 1937b, 1941) and used with great success by Counsellor (1943) and others.
  - 5. Without attempting to lay down any absolute rule I think that, where possible, a Pfannenstiel incision should be used and, with a view to the future security of the abdominal wall, the fascia should be raised transversely rather than be obtained from the midline.

The answers to these questions and suggestions cannot be found in discussion, which is always discordant and frequently loose; they must be determined in accordance with practice and results. For the

- moment, then, I have adopted the following approach; however much it may be open to question, it is at least defined and clean-cut.
- (a) In patients who present themselves primarily with symptoms referable to prolapse of varying degrees and do not unduly emphasize the inconvenience of their stress incontinence, I perform a Manchester type of operation with the addition of certain well-known technical points directed to the re-establishment of vesical and urethral control.
- (b) In patients who place stress incontinence in the forefront of all their symptoms and insist upon its relief, a sling is added to whichever of the vaginal procedures may seem necessary. In actual practice such patients are usually those with moderate degrees of uterine or vaginal displacements. In this group also are those patients in whom the only anatomical deformity is an urethrocele. The necessary vaginal repair is carried out, and 3 courses are then open to us: (1) a single detached fascial loop may be passed using the technical assistance recently described by Studdiford; (2) an Aldridge or Studdiford type of operation may be employed; (3) the vaginal procedure is completed and a sling is passed wholly by the suprapubic technique.
- (c) I believe (for the time being) a sling operation by the supra- and retropubic route to be the operation of election in patients who have undergone previous vaginal operations for relief of stress incontinence and in whom, though the anatomical result has been good, establishment of urinary control has failed.
- (d) There are the patients described above (para. 2) in whom there is no real degree of anatomical deformity or displacement and yet stress incontinence is persistent and distressing. A primary supraand retropubic operation is carried out. A

posterior colpoperineorrhaphy may be necessary but the anterior vaginal wall is not touched.

(e) Where there is an indication for its use and yet there appears to be no need to perform a vaginal repair, a suprapubic fascial sling operation can conveniently be combined with any ordinary intraperitoneal procedure, such as subtotal hysterectomy for fibroids, etc.

#### THE OPERATIONS.

It is sometimes of value to the reader to know how others were first stimulated to an interest in certain procedures. I first became conscious, some years ago, of the accessibility of the urethra from above when performing the Waters extraperitoneal Caesarean section. I was curious enough to prove that it was accessible in the non-pregnant state while making occasional use of the Pfannenstiel incision for gynaecological procedures. This knowledge was put to no immediate use. With the appearance of the papers by Aldridge and by Studdiford it assumed a fresh significance and led me to an investigation of the history and evolution of these and similar methods.

It is not proposed to set down the fruits of that enquiry here; it can be said, however, that any further pretence to orginality was thrown to the winds. Indeed, my advice to any surgeon who would run a comfortable and complacent course is: eschew the literature! An historical description of the former of the two operations set out below and practised by myself would run like this: It is a suprapubic procedure designed to sling up the urethra with two strips of fascia; these latter are raised from the anterior rectus sheaths and are pedicled laterally in the external and internal oblique muscles, as was first devised, suggested, practised, and illustrated by Hans Hans (1925, 1929). (Fig. 1.)

Here I may be allowed to evince a little surprise. The principles and successes of fascial sling operations have been established and amply recorded over many years. (Hans, 1925, 1929; Baumm, 1931; Crainer, 1929.) How has it come about that until 1942 they have been almost completely passed over by British and American gynaecologists?

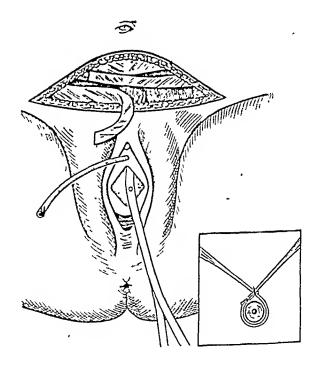


Fig. 1.

Redrawn from the illustration to the article by Hans Hans. His was a combined abdominal and vaginal operation. The inset has been added to show his method of encircling the urethra.

#### . Preliminaries.

I. A rubber catheter is passed and fastened to the vulva with a silkworm suture; a de Pezzer can be used with a view to better definition of the vesical neck. The catheter is removed on the 9th day; for the removal of the latter type a small dose of pentothal is given. If a roller bandage is placed in the vulva and the lower half of the vagina the anterior wall is stabilized. For

the urethral stage of the operation a moderate degree of Trendelenberg tilting is helpful and adequate illumination is essential. Two special instruments have been devised; while not absolutely necessary they perform their functions well (Fig. 2).

2. The skin incision. This need not be quite so long as the fascia to be raised, for its lateral angles can be alternately retracted in order to expose the muscle fibres of the external oblique. Its central portion crosses the midline about 4 cm. above the upper border of the symphysis (Fig. 3).

- 3. Preparation of the fascial strips. The integument is raised from the aponeurosis in an upward direction and the fascial surface cleaned, from the fibres of one external oblique to the other. Two small incisions are made through the aponeurosis on each side of the linea alba, the upper about  $2\frac{1}{2}$  cm. above the lower ones (Fig. 4). Through the four incisions in the aponeurosis the closed blades of the scissors are passed laterally as far as possible, then separated and withdrawn. These initial incisions are in turn extended outward until actual muscle fibres are reached. Finally, when the attached central position of the fascia has been dissected off the linea alba we are left with a "bucket-handle". whose sole attachments are to the fibres of the external and internal oblique muscles of each side.
- 4. Exposure of transversalis fascia and underlying peritoneum. Two artery forceps are applied to the lower free edges of the rectus sheaths, one on either side of the midline and with the knife the aponeurosis is freed from the linea alba right down to the upper border of the symphysis. The medial borders of the rectus and pyramidalis muscles are separated by sharp dissection and undermined laterally for a short distance to raise them from fascia transversalis, preperitoneal tissue, and peritoneum.

5. Formation of the retropubic space. The two index fingers are placed, ulnar borders towards the bone, against the posterior aspect of the upper border of the symphysis. Kept close to the bone, they are worked downwards until a real resistance is met. They are then swept laterally and finally withdrawn in such a way as to retract the inferolateral surfaces of the bladder upwards and backwards (Fig. 5).

This is a convenient place to introduce an anatomical note.

With the first described manoeuvre the fingers entered (Figs. 6, 7, 8) and created the prevesical and, with the separation of the fingers, its lateral extensions, the paravesical spaces. Before its artificial creation this "space" is filled only with loose areolar and fatty tissue. If the fingers are forced still more deeply along the anterior walls of the pre- and paravesical spaces a definite resistance is encountered both in the midline and laterally. With the wiping of a sponge on a holder and the aid of good illumination the reason for this can be seen. There is now displayed the torus pubicus and the upper three-quarters of the back of the symphysis, while a little further out if the wall is gently stroked and cleaned in a downward direction, the anterior end of the arcus tendineus is seen and below this level, shining through its covering fascia, the comb-like arrangement of the fibres of the pubococcygeus. But only a shortish length of these is visible for the wiping action reveals another fascial thickening-a "white line" -running from in front backwards and roughly parallel to the arcus tendineus but at a lower depth. From this line to the corresponding one on the other side there spreads across the (unseen) cleft between the converging levator muscles, a greyish-white sheet of tissue. This receives an attachment anteriorly to the back of the symphysis near the junction of its upper three-quarters and its lowermost quarter. Posteriorly, this sheet of tissue fuses with the fascial coverings of the bladder along the anterior and lateral aspects of its base. This sheet of tissue, which medially includes the urethra, appears to be single but is chiefly constituted by the two pubovesical tracts of fibromuscular tissue. It thus forms a "third pelvic diaphragm" in this

region. It hides from view the cleft between the medial borders of the pubococcygens (the levator pillars) and also the urethra plunging downwards and forwards through it to pierce the progenital diaphragm and open almost immediately into the vestibule of the vagina. The urethra and these tracts of tissue are not quite in the same plane for while the latter are proceeding in the general direction, bladder base to back of symphysis, the former is directed towards the subpubic angle. To reach the anterior wall of the urethra immediately behind the symphysis the attachments of the pulovesical ligaments would have to be broken through, and even then, before encountering the canal, the dorsal vein of the clitoris would be met. But for the shape and prominence given to it by the indwelling catheter the urethra would not be visible, and indeed, barely palpable in its course through and beneath this roofing sheet of fascia. These pubovesical tracts are of only moderate strength yet the resistance they can offer to finger or instrument is readily appreciated by those who have performed sling operations, either by the Aldridge or the Studdiford techniques. In both they have to be pierced from below a short distance behind the symphysis and between the urethra and the "white line" laterally.

It is generally conceded that these tracts exert a stabilizing and supportive effect on urethra and vesical neck, helping to maintain these in their normal relation to the back of the symphysis; and because of the overflow of fibres which they receive from bladder base and the intrinsic urethral musculature, they offer this latter an additional source of purchase and enable it to function at its highest efficiency. The ways in which the integrity of these tracts can be compromised are easily evident from a consideration of their course, their structure, and their attachments. The malign influences at work are trauma of childbirth, involutionary effects of the menopause and the changes due to old age.

The urethra is some 3 to 4 cm. in length and possesses considerable elasticity in both radial and longitudinal directions. Its extrapelvic portion is very short and its union with the anterior vaginal wall extremely close. Its intrapelvic portion is united to the vagina by the urethrovaginal septum of relatively avascular connective tissue. The urethra in this portion has a wall of its own the

whole way round. It is separable from the underlying vagina, and with the catheter in situ, can easily be raised from the latter either with the fingers or the special instrument. On its lateral and anterior aspects, but deep to the pubovesical tracts, the urethra is embraced by the pudendal plexus of veins (plexus of Santorini).

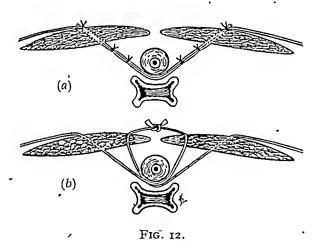
As the operation is performed with an empty bladder the actual vesical neck is neither truly visible or palpable. Its position is simply estimated unless, of course, some form of de Pezzer catheter is employed.

6. Preparation of the slings. The "bucket-handle" is raised out of the wound, its borders are fixed by a series of mosquito forceps and it is then split with the scissors throughout its length (Fig. 9). It will be noticed that except in its central portion the "bucket-handle" consists of two layers of fascia and, to obtain a neat splitting, it is important to align these in the grasp of the forceps. Two musculofascial strips are thus obtained which are of a length sufficient for any type of sling. Ligatures of catgut are attached to the ends of the fascial strips and each is drawn either behind its corresponding rectus muscle or, better still, through the centre of the latter, as performed by Charles Read (Fig. 10).

7. Passage of the slings. With the palm of the left hand directed towards the bladder and pressing it upwards and backwards, the tips of two fingers are placed astride the catheter and urethra just behind the symphysis. They are then drawn towards the operator for about 12 inches, and with the urethra-holding instrument the catheter and canal are grasped and surrounded just distal to these fingers (Fig. 11). The urethra and vesical neck are now raised from the vaginal wall. The fascia-introducing instrument carrying the guide thread attached to the right fascial strip is then passed into the substance of the right pubovesical tissue, beneath the urethra, and

finally, after cutting down upon its point, made to pierce the left pubovesical tract. The thread is freed, replaced with that attached to the left strip, and the instrument withdrawn. The strips are then pulled through beneath the urethra and the "sling" is constituted (Fig. 10).

The passage of the strips is, of course, the crucial step in the operation and anything which contributes to its ease, speed, and accuracy is important. The effective portion of the instrument (Fig. 2) is: (1) so angled on the handle that, though the latter is not held in midline, its surface is in the same plane as the urethro-vaginal septum, and its curve is at right angles to the course of the urethra; (2) of such a width that it creates a channel ample for the easy passage of the fascial strips.



Two of the many possible ways of completing the Sling.

The returning loops of the slings can be anchored: (I) by simply overlapping them and binding them together with two or three stainless-steel sutures on each side (Fig. 12a); or (2) by drawing their free ends again through the rectus muscles in a reverse direction and by knotting and suturing them in front of the lower ends of these muscles (Fig. 12b).

It will readily be seen that there are numerous architectural possibilities.

Elevation of urethral and vesical neck.

The amount of tension which should be put on the sling and the degree to which the urethrovesical junction should be elevated is a matter which only time and a much greater experience can possibly decide. The patient in whom I produced most distortion of this region had not the slightest difficulty in passing urine when the catheter was removed on the 4th day. Two others in whom less elevation had been produced had considerable difficulty and many days elapsed before the power of normal evacuation had returned.

For success a distinct degree of elevation of the vesical neck and urethra would seem to be necessary. Beyond this we can offer the reader no further help. We can only assure him that in their early attempts to establish normal evacuation of the bladder a few patients will reduce both themselves and their surgeon to a state of some anxiety and apprehension.

### SINGLE DETACHED FASCIAL-LOOP OPERATION.

The advantage is that the "buckethandle " is raised in just the same way but need be only half the width (one finger breadth), and consequently there is little risk of weakening the abdominal wall. After passage beneath the urethra both ends are drawn through the rectus muscles just above the symphysis, overlapped and sutured in the usual way. (Figs. 13, 14.) Alternatively they can be fastened anteriorly in front of the rectus sheaths. The available length of fascia is well in excess of what is required and instead of overlapping it can be fastened by sutures and tied in a reef knot. procedure is a little quicker than the previous operation and in their results the two,

so far, are indistinguishable. Fastened as it is just above the symphysis this sling will be almost at rest during the early post-operative days. Consequently the vesical neck will undergo only a minimal excursion in response to movements of the abdominal musculature—perhaps a good thing during the healing process. After both these operations the rectus muscles are united with a series of interrupted sutures, the aponeurosis with a continuous suture and the skin with clips.

This single-loop operation differs from that of Baumm (1931) in the following ways: (1) certain details of technique; (2) his was a combined abdominal and vaginal operation; (3) instead of rectus fascia he employed strips specially prepared from the pericardium of the ox.

#### HAEMORRHAGE.

Needless to say haemostasis is essential throughout the operation in order to prevent haematomata and diminish the risk of infection. The superficial blood vessels supplying the integument of the lower abdominal wall are divided transversely and bleeding points, especially in the lower edge of the wound, should be carefully secured. In cleaning the aponeurosis and again in raising the "bucket-handle" small perforating muscular twigs are interrupted and must be cared for. Only clumsy operating can endanger the main trunks of the deep epigastric vessels; their retropubic branches might conceivably be severed in separating the rectus muscles right down to their insertions.

Some injury to the pudendal plexus of veins is almost unavoidable when passing the fascial introducer beneath the urethra. Venous oozing usually occurs from wounds of entry and exit in the pubovesical fascia but this is easily controlled by pressure and has ceased by the time the strips have been overlapped and sutured.

If the above points are attended to in their proper sequence the majority of these operations proceed cleanly and smoothly and, indeed, become little more than a neat and pretty exercise in lower abdominal anatomy. They can be comfortably executed in 30 minutes in a thin woman.

The prevesical space is sometimes drained through a stab incision placed a few cm. below the centre of the Pfannenstiel. The tube is removed on the 4th day.

#### THE MODE OF ACTION OF THE SLING.

Before the end of the operation the musculo-fascial action on the vesical neck can be observed during the respiratory rise and fall of the abdominal sheet of muscle; if anaesthesia is inadvertently lightened and the patient strains or vomits this effect can be violent and truly frightening. From these observations it would be easy to imagine that such muscular control of the urethral channel would persist indefinitely; and the gynaecologist in the role of orthopaedist would indeed be a picture very pretty to contemplate. Hans-Hans apparently cast himself in such a role, for he believed the chief virtue of his operation lay in the origin of his strips from muscle whose blood and nerve supply remained carefully preserved. Such, however, is not the case. No doubt in the early post-operative period, as a result of vomiting or coughing, movements are still transmitted to the vesical neck and this by some might reasonably be regarded as an undesirable rather than a favourable side-effect of a musculo-fascial sling. the strips, as a result of the healing process, soon become firmly adherent to the rectus muscles and their overlying sheaths, and the retropubic space becomes filled with dense fibrous tissue which cannot be broken down with the fingers, but actually requires scissors dissection. All this I have been able to prove (if any proof were needed) in

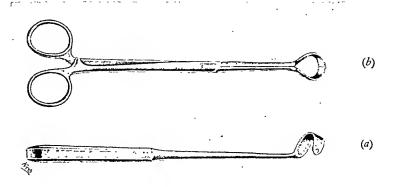


Fig. 2. (a) Fascia-introducer and (b) urethra-holding forceps, as designed by the writer and made by Messrs. Thackeray of Leeds.  $\times 1/3$ .

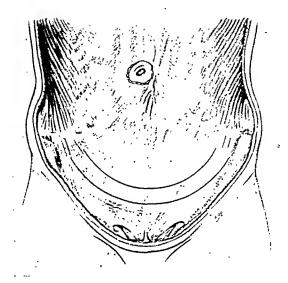


Fig. 3. Approximate site and length of skin incision (white); width and extent of fascial strip (black).

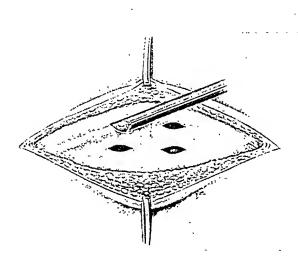


Fig. 4. Preparation of "bucket-handle."

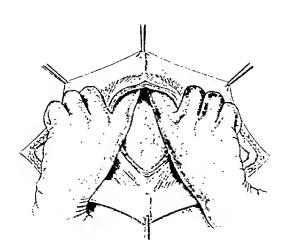


Fig. 5. Preparation of pre- and paravesical

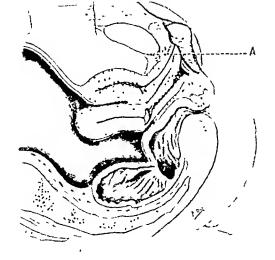


Fig. 6. The operative space. A—The pubovesical tracts and their pubic insertions.

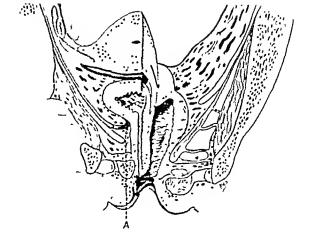


Fig. 7. Frontal section. A—White line of origin of pelvic fascia, pubovesical tract, and insertion of latter in region of vesical base.

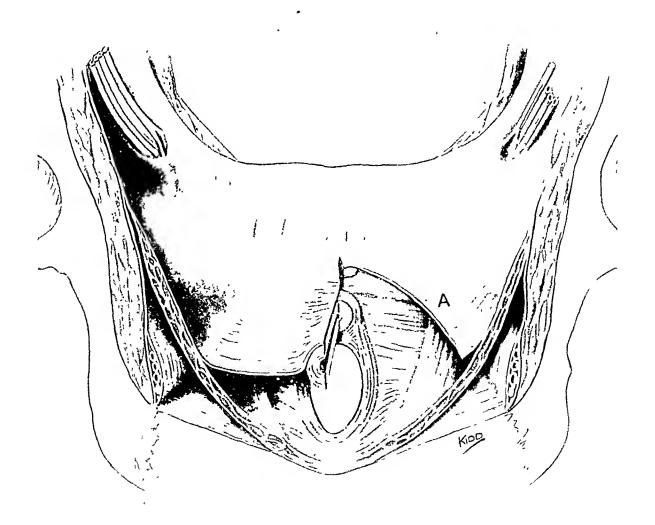


Fig. 8. The "third pelvic diaphragm," cut away on the right of the picture. Partly diagrammatic. A—White line of origin of pelvic fascia and attachment of pubovesical sheet.

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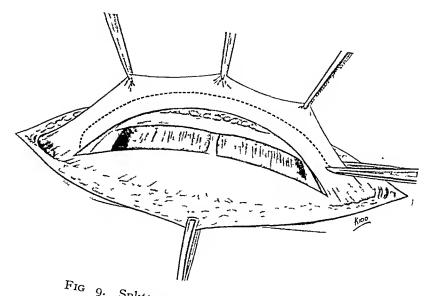


Fig 9. Splitting of "bucket-handle"

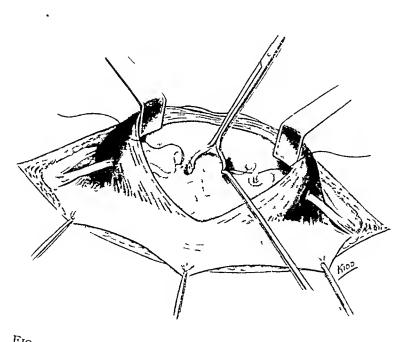
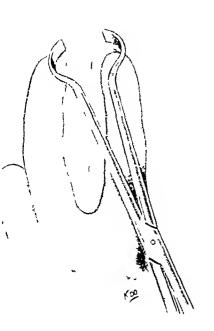
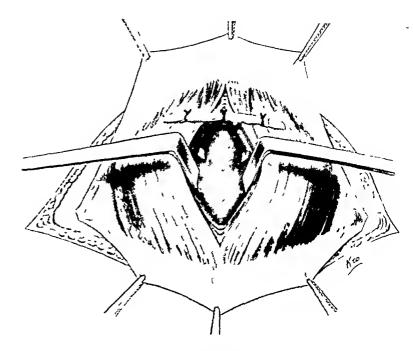


Fig. 10 Urethral forceps and fascia-introducer in use.





Application of urethra-holding forceps.

Fig. 13. The single-loop detached fascial sling. In this case the loop is completed in front of the muscles and not the rectus fascia.

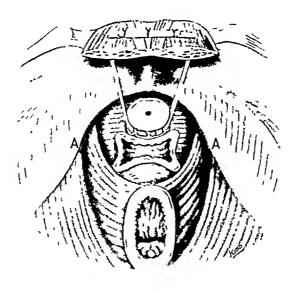


Fig. 14. The final anatomy, showing single loop in position and elevation of urethra and vagina towards the back of the symphysis. A—White line of origin of the "third pelvic diaphragm," which is omitted from the illustration.

the one patient I have had occasion to reopen some weeks after the original operation.

The early German workers in this field were at first inclined to attach unlimited virtues to the active working of pyramidalis and fascial strips. It was not long, however, until the consensus was that these grafts had a purely passive action and that their success had to be explained by other factors.

I think we may now safely assume the following to be true. The sling plays in the main a passive role. It elevates the vesical neck and proximal urethra and restores them at least to their normal positions relative to the back of the symphysis; in most cases overcorrection will actually be the result. It increases the length and tension of the urethra. If the fascial introducer is made to enter and emerge some distance lateral to the urethra it should elevate and increase the tension of the stretched and perhaps damaged portions of the pubo-vesical tracts. It gives to the most proximal portion of the urethra a direction which is somewhat tangential to the base of the bladder and which will be even more marked when the latter has reached a state of moderate distension. It forms a scaffolding for the fibrous reaction which is consequent to the operative intervention, and on this and its permanence depends the success of the operation. In a few patients there is certainly produced some kinking of the urethral channel and this obstructive effect may be a factor in the cure of incontinence. Finally, because of its connexion with the musculo-aponeurotic sheet of the abdominal wall, this retropubic fibrous tissue may possibly reflect, in however small a degree, the movements of the former and so indirectly exert some active control over the vesical neck and urethral passage.

The post-operative management has proceeded by methods of trial and error. The drainage tube is removed on the 4th day.

There is a moderate amount of bloodstained, serous discharge. The catheter is removed on the 9th day. As important as urinary antiseptics, penicillin, and the day on which the catheter is removed is the psychological approach. Above everything else, it is important that these patients should at no time gain the impression that they have undergone some unusual or extraordinary procedure. Once they do then they become suspicious and apprehensive. If, in addition, their early attempts to pass urine are not immediately successful their worst suspicions are regarded as confirmed and a train of unhappy, though fortunately only temporary, complications may be the consequence.

#### CONCLUSIONS.

The above descriptions are founded on an experience of 25 sling operations (October 1947), the majority being of the types described. The results have been eminently satisfactory on the whole, but it is felt that a detailed account of these should be withheld until the numbers have increased and further time has elapsed. There has been only one complete failure. In another the indications were stretched to include stress incontinence and nocturnal enuresis; the former was largely relieved but the operation failed to cured the latter. In 2 other patients the fault has lain in overcorrection; for the stress incontinence difficulty in micturition has been substituted; but now, some 6 months later, both these patients are improving.\*

\*Terence Millin and Charles D. Read have recently published (Post. Grad. Med. J., Feb., 1948) their results from an operation similar to the first of the two procedures described in this paper. They have practised their operation over a longer period, and the number of their cases exceeds my own. Much of radiological and clinical interest is included in their contribution, and their conclusions, based on 130 operations, should be studied by all who are interested in this subject.

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## Virilizing Tumours of the Ovary With Report of a Case Associated with Pregnancy

BΥ

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INTERSEXUALITY has provided many interesting clinical problems. Amongst these, virilization of the adult human female has been analyzed with partial success. various types have been found to result from endocrine activity originating in the adrenal bodies-adreno-cortical syndrome (Broster and Vines, 1933); and in the pituitary—Cushing's syndrome (Cushing, 1932). In some cases, the virilizing changes have taken place where no tumour or even hyperplasia could be demonstrated. The relative parts played by the two glands are not vet clarified. Comparable clinical states have been found associated with ovarian tumours. Blair-Bell (1915) reported the first case in England of masculinization associated with an ovarian tumour which he removed successfully. The cytological composition of all masculinizing tumours of the ovary is not the same and comparatively few have been recorded. The true arrhenoblastoma, as described by Pick (1905) and brought into line with other ovarian tumours by Meyer (1931) has a tubular adenomatous structure or has cells resembling this. A smaller group is made up of large lipoid-filled cells resembling the adrenal, which Barzilai (1943) has named "Virilizing lipoid-cell tumour of the ovary". The latter group is the less common. Kepler, Dockerty and

Priestley (1944), in recording a new case of their own, found only 13 cases in a review of the literature. Since then cases have been reported by Novak (1944), Twombley (1946), Curtis (1947), Douglass (1947), Williams and Mendenhall (1947), Greene and Lapp (1944), Burket and Abell (1944).

With such a small number it is not possible to outline a histogenetic plan. There has been a tendency to evoke an origin from luteal cells just as the germinal follicle had been suggested as the source of the granulosa-cell tumour — so-called feminizing ovarian tumour. But, as Novak (1947) points out, most authors doubt that the mature, functioning, luteal cell is capable of neoplastic growth.

Interesting is the report by Groat (1944) of experiments on young ground squirrels. They were maintained after bilateral adrenalectomy on an adequate diet reinforced by high chloride intake. The ovaries of those animals which throve on this regime showed histological proliferation of adrenal-like cells to an extraordinary degree. Comparable changes are reported by Geist and Gaines (1942) as a result of the administration of gonadotrophins to suckling rats. On the other hand it is possible that the luteal cell may undergo hyperplasia, even with an abnormal or unexpected hormone output. Reviews, such as

that of Iverson (1947) do not, we think, help to solve our problem, although one case is reported showing some parts of the tumour of lipoid-cell type while the remainder is arrhenoblastomatous. That these tumours arise from adrenal rests (Schiller, 1939) has always been an attractive theory though adrenal rests within the ovary are very rarely found in the adult. But Grollman (1936) states that they may be found not uncommonly at birth. They are encountered along the ovarian vessels, near the ovary or in the broad ligament. We have records of one such rest situated in the mesovarium. It measures 3 mm. (Fig. 1) and the patient has no virilizing features.

We now report a further case of adrenallike tumour of the ovary uniquely, we believe, associated with pregnancy.

#### CASE HISTORY.

The patient was 33 years of age when she first came under observation, and was pregnant, the last menstrual period having occurred on 4th April, 1942. Pregnancy had proceeded apparently normally until early in September 1942, when she should have been about 24 weeks pregnant. She noticed then a great increase in growth of hair on the face and her voice becoming deep.

Early in December she came under the care of one of us (W.N.S.) at the Chelsea Hospital for Women. Estimated from the date of the last period she would be about 34 weeks pregnant. The fundus, however, was much lower than corresponded with this. She said she had never felt foetal movements and wondered if all could be well with the pregnancy. An X-ray was taken and the report suggested "intra-uterine death". Spalding's sign and angulation of the spine were reported. The preliminary diagnosis lay between arrhenoblastoma and an adrenal tumour. Assuming the correctness of the above X-ray report, evacuation of the uterus followed by laparotomy was contemplated.

Previous history. The patient had always been extremely healthy (Fig. 2). There had been some slight loss in weight during the last 6 months. Menstruation began at the age of 12 and had been

regular, occurring every 28 days and lasting 5 days. She had suffered from slight dysmenorrhoea. She married at the age of 23 and contraception was practised for nearly 10 years, until March 1942, when she decided to have a child. Following this decision she had only one more period.

On examination the patient showed a growth of coarse, black hair on the chin extending upwards in the normal male distribution to the hair line on the scalp. The lower lip was almost spared and the upper lip showed a finer type of growth (Fig. 3). The pubic hair was excessive in quantity and male in its distribution, with a marked black line running to the umbilicus, and a certain amount of hairy growth between the umbilicus and ensiform cartilage. There were a few dark hairs on the chest and over the scapulae but none around the areolae of the breasts. The arms and legs were rather more hairy than usual, but not markedly so. The voice was deep and masculine. Psychologically, the patient seemed to be normal. She said that her only psychological change had been slight irritability lately, due she thought to her consciousness of a somewhat startling appearance. She had never had more than a "mild interest" in sexual relations and did not know what an orgasm wascertainly she had never experienced it. deficient sexual response remained unaffected by her pregnancy and the development of her symptoms. No abnormal interest in members of her own sex had accompanied the virilizing changes.

The heart and cardio-vascular system were normal except that the blood-pressure was raised, being 170/120. 'The fundus uteri corresponded to 27 weeks' gestation and the foetus was presenting as a vertex. There was hypertrophy of the clitoris.

Foetal movements were felt and the foetal heart clearly heard. On vaginal examination the pelvis appeared normal. No pelvic tumour was palpable. On one occasion only a mobile swelling was palpated in the right flank, but this was not confirmed by subsequent examinations. The report on a second X-ray was: "One foetus is present, presenting as a vertex. The foetus is radiologically normal, and the estimated maturity about 30 weeks."

Progress. The patient remained as an ambulant in-patient until 11th January, 1943, the exact calculated date for confinement, when she went into labour. After 3 hours a living child was born, following a 2nd stage of ten minutes. The

placenta was expelled normally. The child, a male weighing 5 pounds 6 ounces, showed no gross evidence of prematurity. Lactation was never established. The puerperium was normal except for this.

On 23rd January, 1943, the patient was examined vaginally. The uterus was involuting well and no tumour was palpated. An intravenous pyelogram showed normal renal shadows and renal function. It was decided to proceed with the exploratory laparotomy. This was carried out by one of us (W.N.S.) and Mr. A. A. Kidd of Kingston County Hospital.

Operation: 10th February, 1943.

Under gas, oxygen and ether anaesthesia the abdomen was opened. The suprarenals were palpated and nothing abnormal detected. On exploring the lower abdomen, however, a cystic mass about the size of a cricket ball was found lying anteriorly to the right broad ligament. A long pedicle had evidently allowed of considerable "wandering", and the cyst had finally "jumped" the broad ligament. The cyst was excised and the pedicle buried.

Subsequent notes. After operation the patient made a perfectly normal recovery. She was allowed up on the 17th day and went home on the 25th. There was then no change whatever in her appearance, and no appreciable alteration in the pitch of the voice. She had no mental or psychological disturbances.

30th March, 1943. Marked acne of the face. Hairs would not pull out.

12th April, 1943. Acne improving, but hairs still well rooted.

4th May, 1943. (Approximated 3 months after operation.) Hairs coming out. Voice (?) slightly higher in pitch. Right femoral hernia discovered.

25th May, 1943. Acne nearly gone. Hair on the face also nearly lost.

22nd June, 1943. (Four and a half months after the operation.) Acne better. Abdominal hair has returned to female distribution.

31st August, 1943. "Was only vaguely interested in sexual relations before, but certainly not now." Used to have intercourse twice a week, but none since the operation. Did not seem sure if she had ever experienced orgasm; but admitted a certain amount of "feeling." 4th January, 1944. Voice is perhaps a little better, but improvement is not marked. No acne and no hair on the face. The right femoral hernia had been cured by operation. The baby of 11 months now weighed 27 pounds. No sexual interest and she and her husband are drifting apart. Periods 4/28. The menstrual loss is more than before she had the baby. As she uses 24 diapers at the period she may have a mild menorrhagia.

2nd May, 1944. Periods 4/28, and now rather scanty.

24th April, 1945. No sexual desire at all; periods 6/28, and vary in amount, sometimes scanty, usually free. Voice still low. Nothing abnormal on vaginal examination.

30th September, 1947. General health much better (used to feel weary). Looks very well. Face hairless. She occasionally gets a long coarse hair growing on the face and she pulls this out. Periods now 5-6/28. Previous to that they were scanty for some months. Now back to the normal amount (one year). Complains of occasional pain at the top of the thighs. Pain over the sacrum. Voice still gruff. Good deal of white discharge, has had it since she became pregnant. Again is quite surethat she has never experienced an orgasm. Her son is alive and normal in every way.

On examination. Female distribution of abdominal hair. Face clear. Per vaginam nothing abnormal. Clitoris within normal limits. Speculum: Small erosion and mucoid discharge from this area. A saline solution of the discharge was examined to exclude Trichomonas infection. Erosion cauterized with silver stick. Blood: No polycythaemia. Blood-pressure, 116/84. Urine: No reducing substances. Weight: 9 stone (usual).

## SUMMARY OF CLINICAL FEATURES OF THE CASE.

We understand that this is the only reported case of an adrenal-like ovarian tumour appearing and causing virilism during pregnancy, although other types of ovarian tumours have been recorded in association with gestation (Selye, 1946). we were fortunate in having the opportunity to carry out hormone excretion estimations during the latter part of the

pregnancy and after the tumour had been removed. These results are referred to elsewhere in this paper.

It was also fortunate that we were saved the error of a premature evacuation of the uterus on the strength of the patient's story and the first X-ray report. In spite of pre-operative search for a cyst, this one was elusive and was felt only once in the right flank. This may be explained by the unusually long pedicle of the cyst. At laparotomy it was found that the cyst had "jumped" the broad ligament.

At no time had the patient complained of headaches. The high blood-pressure present when she was first seen has returned to normal. Other features of the Cushing syndrome have been noted in adrenal-like tumours but they do not occur in arrhenoblastomata. The marked hirsutism with a typical masculine distribution and the arresting change in the pitch of her voice were not accompanied by noticeable increase in size of the clitoris nor by psychological disturbance (except worry about her appearance) nor by sexual change, either in the direction of an increase of her subnormal sexual interest and response, or as far as we can gather of complete loss of interest. There was no morbid sexual. interest.

The tumour did not affect either the disposition of fat or the feminine characteristics of her form. The breasts did not lose their normal size and shape though at no time did they show evidence of secretion. Could endocrinal imbalance in some way have been responsible for the small size of the baby and the late perception of movements?

There was no departure from the average reaction to operation and the immediate post-operative progress was perfectly normal. No unusual degree of shock or any subsequent sign of adrenal insufficiency occurred. The loss of the abnormal hair

did not commence till 3 months after the removal of the tumour, but went steadily to complete restoration of the female distribution, the process taking 6 weeks. Since then she has occasionally grown a coarse, black hair on the face. The voice has not recovered after nearly 5 years. If any improvement has occurred it is not at all marked. Had we made recordings of her voice a minor degree at most might be demonstrable.

The behaviour of the periods after their reappearance shows first, a year of greater loss than before the baby, then a few months of scanty periods, followed by a gradual increase until a variable menorrhagia existed. This continued for several years, and finally there was gradual damping down until normality was again reached. It is difficult to imagine how the tumour, or its removal, could be responsible for these variations.

The other ovary was normal and there have been no symptoms of lack of ovarian secretions. Neither the macroscopic appearance of the tumour, nor the subsequent history of the patient suggests malignancy.

#### URINARY HORMONE EXCRETION.

Several urine specimens were examined by Dr. F. L. Warren (1945) for 17-ketosteroids. He has kindly forwarded his results, shown in the following table.

TABLE.

Record of 17-ketosteroid excretion in Relation to Clinical Events.

Clinical Events.	
Date	Patient's urine
30.12.1942.	158 mg. ketosteroids per day.
11. 1.1943.	Infant born.
2. 2.1943.	23 mg. ketosteroids per day.
	Ovarian cyst removed.
15. 2.1943.	12.8 mg. ketosteroids per day.

12. 2.1943 Infant's urine: 13.8 mg.

ketosteroids per litre.

#### THE TUMOUR.

This is a lax cyst measuring 8 × 7 × 5.5 cm. On bisection mucoid fluid escaped from the single cavity. The cyst wall is about 3 mm. in thickness and its lining is smooth. A solid area measuring 5 × 1.5 cm. and oval in shape is seen in the region of the ovarian attachment. Bisection of the solid area shows a mud-coloured surface interspersed with numerous small bright yellow punctate areas.

Histology. Paraffin sections were prepared from 3 different areas and stained with haemotoxylin and eosin. Special stains for glycogen, lipoids or fuchsinophil granules were not made.

The cyst wall. The innermost layer, which is thick, is composed of coagulated fibrin which has undergone organization. More peripherally there is granulation tissue. These are covered by a rind of ovarian tissue. In the boundary zone a few islands of theca cells are clearly visible. An occasional cell is luteinized. As the tumour is approached lipoid cells appear in large irregular areas, seeming to have proliferated from the zone described.

The tumour. The tumour is composed of a loose, connective tissue ground-work in which are set irregular sheets or masses of polyhedral cells. Blood vessels are frequent. Many have relatively thick walls, but often tumour cells are separated from the lumen only by a single endothelial layer. There are several small areas of lymphocytes.

The tumour cells resemble those of the adrenal cortex. The size of the cells varies from 5 to 60 $\mu$  but the average size ranges from 5 to 20 $\mu$ .

The cytoplasm stains in a variety of ways. The general rule is for a semi-clear or granular appearance. In others the cytoplasm is a more diffuse but pale pink. These cells are the smallest in the tumour.

Other cells show distinct brownish granules, probably lipochrome. Lastly, there are cells, occurring singly or in clusters of 3 to 5. In these the cytoplasm stains heavily, and is a bright pink. It is usually faintly granular. The nuclei show great variation in size, 5 to 20p. They occupy an area in the cell of usually less than one half. Occasionally 2 nuclei are present. The nucleus stains moderately but where the nucleus is unusually large it is often hyperchromatic as well. In the nuclei a distinct nucleolus is present. Mitoses are scarce.

Both from the clinical Comment. and endocrine points of view there is little doubt that this patient underwent considerable changes as a result of greatly increased androgenic activity. These became noticeable when the pregnancy was of about 5 months' duration. The features have retrogressed notably since the removal of the tumour. The change in voice, however, remains more or less unaltered. This is a general finding resulting from irreversible structural changes in the vocal cords. It is noted, however, that although the figures for 17-ketosteroids returned to normal after the removal of the tumour, the most striking reduction, that is from 158mg. 17-ketosteroids per day to 23 mg. per day, took place after delivery and before the tumour was removed.

The ovarian tumour falls readily into the adrenal-like group. There is no evidence to assess it as a true arrhenoblastoma. In this latter group 17-ketosteroids values, where recorded, are much lower.

It may not be possible to say more than that the tumour belongs to the former group. But two possibilities may be considered: first, the tumour may be derived from the corpus luteum, and, secondly, that it it may be an adrenal rest. Earlier workers, amongst them Glynn (1921), were in favour of the former opinion. Against this view it may be stated that such an

occurrence is extremely rare, that the corpus luteum is a short-lived element, and that a condition of virilism is the exact opposite to what might be expected endocrinologically. There are, however, points about our case which favour such a possibility. From the cytological picture there is not enough evidence to call this a tumour, in the sense of neoplasia. Its edges are not regular and, in fact, there are numerous patches of lipoid cells detached from the mass. Then there are the patches of marginal theca cells pointing to a corpus luteum origin. But it is difficult to appreciate, in our present state of knowledge, how this pre-eminently feminine structure would

secrete androgens. It seems apparent that this tissue did in fact produce the androgens, for output fell after its removal. Adrenal rest (cortical) tissue would be quite capable of androgen production but the stimulus seems to have come from outside the ovary and, therefore, outside the adrenal-like tissue. androgen excretion fell appreciably after birth and before the ovary was removed. This latter fact indicates that the gestation was, in some way, either through the placenta or the hypophysis, responsible for the stimulus. It might be said that the foetus, a male, was acting as the stimulus. With this in view urinary androgens were estimated on the infant. The result is, however, of little real value, for lack of control figures. On the other hand, a true tumour of adrenal rest would probably have continued to function until removed. point is not now capable of further elucidation. Although the inference is there, proof could have been given only by not operating on the patient for several months, a course, albeit not considered at the time, which would have had no clinical justification.

The corpus luteum in éarly pregnancy elaborates progesterone and after the 3rd

month generally ceases to be functional. It is suggested that in this case it took on an abnormal function, namely the elaboration of androgens. Baird and Astwood (1946) record a dramatic onset of masculinising features in a woman of 24 years, during the 4th month of her 1st pregnancy. But her masculine features are the more remarkable in that they persisted through 3 additional pregnancies in the succeeding 13 years up to the present pregnancy. At 5 months' gestation her total ketosteroid excretion was 8.4 mg. per 24 hours. But in this case there was no clinical regression following confinement.

Brentnall (1945) recorded the onset of virilism towards the end of the first trimester. He removed an arrhenoblastoma at the time of Caesarean section and in his case early impressions (3 months) suggest that the infant is a female pseudohermaphrodite. Ketosteroids are not recorded.

We are of the opinion that until a considerable number of authenticated cases has been collected it would be well to conserve this group under the heading of Virilizing Lipoid Cell Tumours. This will avoid a prejudged conclusion of their exact origin.

For similar reasons it is not possible to foretell whether the tumour will recur, or cause death from metastasis.

The Ovarian Tumour Committee of the American Gynecological Society, which has been kind enough to express its opinion on sections of this case, placing it in the adrenal-like group, remarks that these tumours are clinically and histologically benign. On these lines it would be unreasonable to expect recurrence.

So far death from metastases has been reported in one case only (Rottino and McGrath (1939). In another case (Burket and Abell (1944) in which hepatic metastases were seen the patient died 11 days after

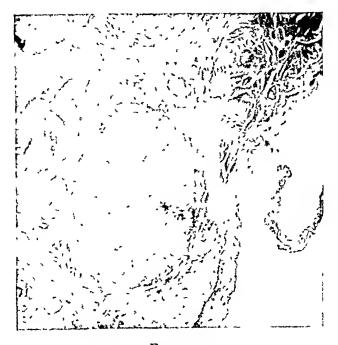


Fig. 1. An adrenal rest in the Mesovarium.

× 45



 $$\operatorname{Fig.}\ 2$$  The patient before the onset of virilism



Fig 3

The patient just before the reinoval of the tumour. The beard and acneiform eruption on the face are shown.

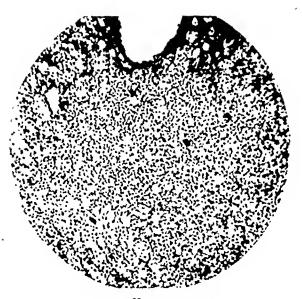


Fig. 4.
A general view of the tumour,

× 100.

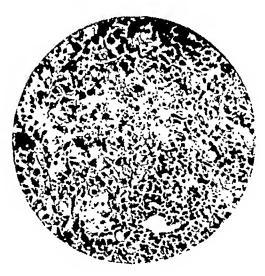


FIG. 5.

A typical area showing the variable size of the lipoid cells and aggregations of lymphocytes.

× 255

s., н. & в.

the operation. By contrast, arrhenoblastomata have been the cause of death in several cases. That a "five-year survival" in the latter group is not necessarily synonymous with cure is exemplified by reports of Krock and Wolferman (1941), Kepler, ct al. (1944), and by Terrades (1929), where death from metastases has occurred 10, 12 and 16 years respectively, after the removal of the primary tumour.

### SUMMARY.

- I. An account is given of a case of virilism in pregnancy.
- 2. Masculine features included change in the voice and hirsutes. Acne and hypertension were present. Lactation was not established.
- 3. There was no polycythaemia, obesity, headache, diabetes or enlargement of the clitoris.
- 4. The successful removal of a virilizing tumour of the ovary is described.
- 5. The pathology of the ovarian cyst is described together with an account of some endocrine considerations.

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# Calcium and Phosphorus Metabolism in Pregnancy (A Survey under War and Post-War Conditions)

### V. CALCIUM AND PHOSPHORUS BALANCES AND LABOUR FINDINGS

E. OBERMER, M.D., M.R.C.S., L.R.C.P.

In a recent attempt (Obermer, 1947) to correlate antenatal findings with calcium and phosphorus balances the cases in this survey were divided into the following 7 groups:

Group A. Controls.

- ,, B. Supplement of calcium phosphate in the form of Calfos tablets.
- together with large doses of Calciferol.
- D. Supplement of calcium phosphate B.P. tablets.
- E. Supplement of calcium phosphate tablets, together with
   Calciferol.
- F. Supplement of Calciferol only, in varying doses—from 800 to 10,000 I.U.

Group G. Supplement of Calciferol only, in varying doses—from 10,000 to 36,000 I.U. per 24 hours.

Figures showing the mean loss or gain of calcium and phosphorus throughout pregnancy were also given in tabular form. This table is reproduced below to serve as a basis for correlation.

### DURATION OF LABOUR.

Of the 48 cases, 40 were primiparae and 8 had had one previous pregnancy.

Of the 40 primiparae, 4 have been excluded from Table II—I case (No. 51) in Group G was delivered by a local practitioner, in a country village, and no note was made of the duration of the different stages of labour; No. 3, in Group A, was a case of intrauterine death; Nos. 31 in Group E, and 44 in Group F, had forceps

TABLE I.

Total Maternal Loss or Gain of Calcium and Phosphorus, throughout Pregnancy.

Mean for each Group (Expressed in grammes)

				(	Calcium		]	Phosphorus			
(	Group	Number of cases	-	Balance throughout pregnancy		Total maternal loss or gain	Balance throughout pregnancy	Content of foetus	Total maternal loss or gain		
	A	6	•	- 135	25	<b>–</b> 160	+ 28	14	+ 14		
	$\mathbf{B}$	6		- 20	25	- 45	+42	14	+28		
	С	7		+ 17	25	_ 8	+90	14	+76		
	D	6		+ I	25	- 24	<b>— 11</b>	14	25		
	$\mathbf{E}$	6		_ I	25	- 26	+ 36	14	+22		
•	$\mathbf{F}$	10	~	- 90	25	-115	- 0.5	14	-14.5		
	G	7		<del>- 45</del>	25	- 70	+17	14	+ 3		

deliveries—the findings for the remaining 36 primiparae are given in Table II.

Tanta: 11.

Mean Duration of Labour: Primiparae (Expressed in minutes)

Group	Number of cases	Mean, 1st stage	Mean, 2nd stage	Mean, 3rd stage	Mean, Total
$\mathbf{A}$	5	958	113	10	1090
В	4	1200	102	17	1410
C	6	1181	105	17	1310
1)	.4	608	140	19	864
E	.,	1270	75	15	1568
F	<del>;</del>	751	68	25	874
G	6	goo	67	22	1049
-					

The number of cases is too small to be statistically significant. It would not be justifiable to draw, even tentative, conclusions from such figures. The variations, such as they are, must be considered as purely coincidental.

On the other hand, when the calcium and phosphorus balances of each individual case in each group are plotted out against the duration of the 2nd stage of labour—selected as less likely to be affected by external conditions or interference than the 1st and 3rd stages—a definite tendency emerges, as can be seen from the graph on page 144.

The three lines in the graph tend to follow each other. In other words, positive calcium and phosphorus balances tend to go with shorter second stages. The numbers treated in this graph are too small to be anything but suggestive. The writer would expect, however, that a larger series of cases, treated in the same manner, would confirm such a correlation. His experience has led him to believe that positive calcium and phosphorus balances in the last 3 months of pregnancy are associated with both more rapid labours and the absence of complications, such as postpartum haemorrhage.

ABNORMALITIES OF LABOUR.

In this series 44 out of the total of 48 labours were normal and without complications. In 4 cases there were minor or major abnormalities:

Case No. 3 (Group A): Intranterine death with subsequent induction.

Case No. 31 (Group E): Developed acute bronchitis just before labour, had forceps delivery for primary inertia.

Case No. 38 (Group F): Postpartum haemorrhage—20 ounces.

Case No. 44 (Group F): Forceps delivery owing to transverse position of the head, followed by manual removal of the placenta owing to incomplete separation and postpartum haemorrhage of 20 ounces.

The net calcium and phosphorus balances (arrived at by adding together the balances determined in each 48-hour investigation throughout pregnancy) are given below for cases 3, 31 and 44. The figures are not given for Case 38 as she was only investigated 3 times throughout pregnancy and the figures are, therefore, not representative.

TABLE III.

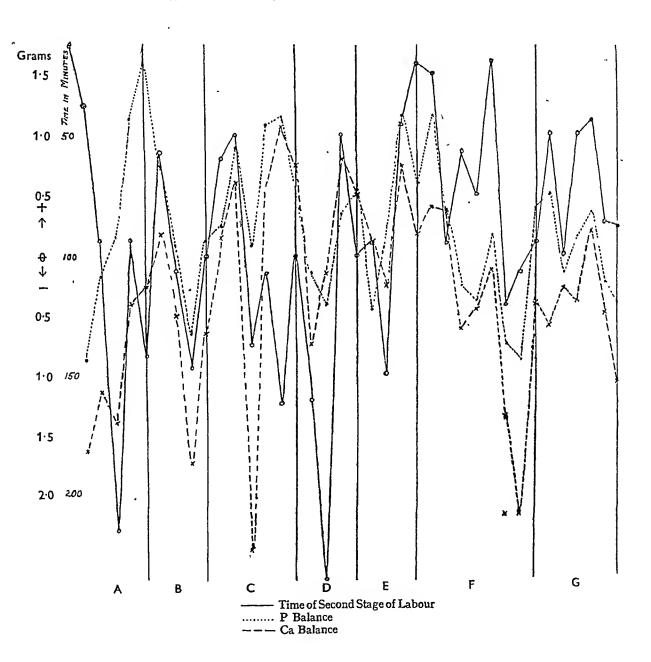
Calcium and Phosphorus Balances in Cases of
Abnormal Labour.

(Balances Expressed in Grammes)

Case	Group		Net Calcium balance	Net Phosphorns balance
3	Ä	6	-4.04	-1.53
31	E F	5	-2.40	-1.22
44	T.	44	-5.19	- 3.07

It may be significant that 3 cases out of 4, i.e., Cases No. 3, 38 and 44, belong to the two groups on low calcium intake or control groups. Further in cases 3 and 44 both calcium and phosphorus balances were negative, a finding unusual even in the control groups. Case No. 31, in spite of being fed adequate supplements of calcium

# RELATION BETWEEN TIME OF SECOND STAGE OF LABOUR AND AVERAGE Ca AND P BALANCE (48-Hour Period) THROUGHOUT PREGNANCY.



phosphate or Calciferol, also showed heavy negative calcium and phosphorus balances.

### WEIGHT OF FOETUS.

Of the 48 cases in this series, 47 had live babies, in 2 cases (both in Group F) there were twins—49 babies in all. Their mean weights per group are given in Table IV.

TABLE IV.

Mean Weights of Foctur.

	No. of				جزر	X
Group	babies	Grammes	Pounds	Ounces	Μ.	$\mathcal{F}$ .
	·- ~ ~ ·		~ · · ·		•	
A	5	3295	7	4	5	O
$\mathbf{B}$	Ö	3440	7	9	2	4
С	7	2950	(+	8	-1	3
1)	6	3370	7	7	6	O
E	6	3170	7	O	4	2
F	12	3040	6	11	5	7
G	7	3330	7	5	-1	3

In considering these figures it should be remembered that there were two pairs of twins in Group F. Hence the mean weight for this group cannot be used for purposes of comparison.

The figure for Group C is the only other figure below 7 pounds. It is definitely the lowest figure for all groups. The cases of this group were not only given supplements of calcium, phosphorus and Calciferol, but Table I also shows that the calcium and phosphorus metabolism of Group C cases more nearly approaches optimum standards than any other group. This fact, together with the data given below, provides further putative evidence against the validity of statements made about premature calcification and excessive size of foetal heads (Brehm, 1937), increased density of foetal bones (Finola, Trump and Grimson, 1937), and postmaturity (Abel, 1931), when calcium and/or Calciferol are fed during pregnancy.

There was also no evidence of prematurity in the control Groups A and F, who showed the heaviest losses of calcium and phosphorus—unlike Garry and Stiven's series (1936).

The figure for Group B, on the other hand, is the highest figure for any of the groups. It also cannot be correlated with the figures in Table I.

Is it possible to correlate these two extreme variations in foetal weight (Group C lowest and Group B highest) with any other factor? Two antenatal factors have been put forward as exerting an influence on the size of the foetus:

- A. The mitrition of the mother.
- B. Parental height and weight.

### A. Nutrition of the Mother.

Though the fallacy that diet affects the size of the baby has long since been exploded by facts—in particular those recorded by German authors during and after the 1914–18 war (Ruge, 1916; Schmidt, 1918; Lipschütz, 1918)—a few obstetricians still believe that a low caloric intake, as advocated by Prochownick (1917) results in a smaller baby and an easier labour. The figures for all groups in this series provide further evidence to the contrary.

Mean Daily Caloric Intuke Throughout Pregnancy.

					-	
Group	Λ	•••				2577
**	В	•••	•••	• • •	•••	2374
• •	С	•••	• • •	•••	•••	2418
• •	D	•••	•••	•••	•••	2425
• •	E	•••		• • •		2380
,,	F	•••	•••	•••	•••	2788
	G	•••	• • •	•••	• • •	2571

There is, of course, no correlation between these figures and the weights as shown in Table IV. It will be seen, however that Groups B, C, D and E have a caloric intake which is significantly lower than Groups A, F and G. Group A had no medicinal supplement; Group F, small doses of Calciferol in the form of drops

		TAB	le V.	
Mean	Heights	and	Weights	of Parents.

		Mothers.				Fathers.					
	H	eight		We	eight	H	leight	·		Weight	
Group	Cm.	Feet	Inches	Kg.	Pounds	Cm.		Inches			Pounds
A	161	5	41/4	56	123	176	5	101/4		67	147
В	` 163	5	51/4	60	132	175	5	10		8 <sup>'</sup> 1	178
С	166	5	6	56	123	174	5	9¾		67	147
D	163	5	5¼	54	119	177	5	103/4	1	71	156
E	159	5	3⅓	50	110	177	5	103/4	-	71.5	157
F	163	5	5¼	62	136	177	5	10¾		70	154
G	164	5	5½	бо	132	178	5	II		74	163

added to milk; and Group G, only a few Radiostol pellets per day. Each case in Groups B, C, D and E, however, had to swallow a considerable number of tablets and pellets, starting with 6 tablets and 6 pellets, and ending with 12 tablets and 12 pellets per day during the last two months of pregnancy. As would be expected, this feat of swallowing or chewing was only possible at the expense of a diminution in appetite.

### B. Parental Height and Weight.

On the other hand, it is a matter of common observation that the height and weight, and in particular the size of the parents, and more especially the father's bones, influence the weight of the baby.

Unfortunately it was not possible to interview the fathers and arrive at an impression of bone size, as the majority of them were out of England, on active service, throughout the survey. In comparing the figures for the father's weight, however, in Table V with the figures in Table IV, it is suggestive that the group in which the father's weight was lowest, i.e., Group C, also showed the lightest babies. Further, Group B fathers were heaviest (81 kg.) in correlation with the heaviest mean foetal weight for the same group (7 pounds 9 ounces).

### Placenta.

The placenta was weighed in only 26 out of the 48 cases.

TABLE VI.
Mean Placental Weights.

.Groups	Number of cases	Grammes	Pounds	Ounces
A	2	650 ·	I	7
А В	6	680	ı	- 8
С	3	593	ı	5
D	2	770	ı	II .
$\mathbf{E}$	3	709	ı	9
F	6	620	I	6
G	4	620	I	6

These few figures are given merely to compare with similar figures in studies of normal pregnancy and labour.

It is of interest, however, to note that in 3 cases—one each in Groups B, C and E—there were large calcified plaques. These three groups were fed calcium supplements. There was no single instance of calcified placenta in the control groups, who were on a low calcium diet.

### Foetal Head Measurements.

Unfortunately, owing to wartime conditions, facilities were not available for measuring more than 26 out of the 49 foetal heads.

Though the figures are few they provide more evidence against the views of the

	Tama VII.
Mcon	Foetal Head Measurements.
	(Expressed in inches)

Group	Number of cases	Suboccipito bregmatic inches	Occipito frontal inclus	Biparietal inches	Bitemporal inches	Circumference inches
Ā	3	A	414	314	3!<	I.4
В	6	4	414	374	312	15
Ö	4	4	4	31:	314	1.4
1)	3	4	414	374	3/4	1.4
E	1	3 4	41:	3 4	3!i	1.4
Ŀ	5	3 4	414	3.5	314	13
G	3	3 4	414	3 4	314	14

authors (mentioned above) who claim that calcium and/or Calciferol feeding during pregnancy are liable to lead to difficulties in labour, due to excessive ossification of the foetal head. Further, those who were responsible for the conduct of labour reported that the degree of moulding was quite normal in all the cases of this series.

### SUMMARY.

- 1. The mean maternal loss or gain of calcium and phosphorus throughout pregnancy for 48 healthy pregnant women, divided into 7 groups, is given in tabular form.
- 2. Forty of these women were primiparae. Of the 40, 36 had normal labours. The mean duration of the 3 stages of labour, for these 36 women, divided into groups, are also given in tabular form.
- 3. A graph is given showing the calcium and phosphorus balances of each individual in each group plotted against the duration of the 2nd stage of labour. There is a tendency for the 3 lines (representing plus or minus calcium balance, plus or minus phosphorus balance, and the duration of labour, respectively) to follow each other. This tendency confirms clinical experience that a positive calcium balance during the last 3 months of pregnancy usually results in a shorter labour,

- 4. Four out of the 48 cases had abnormal labours. The nature of the abnormality is described and the net negative calcium and phosphorus balances of these cases given in tabular form.
- 5. The figures suggest that a maternal deficiency of both calcium and phosphorus throughout pregnancy may well be associated with a more difficult labour and abnormalities such as postpartum haemorrhage.
- 6. A table is given showing mean weights of the figures in all groups. There is no correlation between these figures and the calcium and phosphorus balances.
- 7. Figures are given for the mean daily caloric intake of each group throughout pregnancy. There is no correlation between them and the foetal weights. These figures do, however, show that the daily ingestion of a number of tablets and pellets, as in the calcium, phosphorus and Calciferol supplemented groups, diminishes appetite and reduces the total caloric intake.
- 8. The mean heights and weights of both parents in each group are given in tabular form. A definite correlation is found between the weight of the father and the size of the baby.
- 9. Figures are given for the weight of the placenta in 26 out of the 48 cases. The placenta was calcified in 3 out of the 28

subjects fed supplements of calcium. There was no calcification of the placenta in any of the 23 subjects who were not given calcium supplements.

ro. The mean foetal head measurements per group are given for 28 out of the 48 cases. There is no significant difference between the measurements for the control and the supplemented groups.

II. The above data provide additional negative evidence against the validity of claims in the literature that calcium and phosphorus deficiency during pregnancy results in prematurity and that the feeding of calcium and/or Calciferol supplements results in postmaturity, premature calcification and excessive size of foetal head

with inadequate moulding, and increased density of foetal bones.

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390.

### A Case of Partial Atresia of the Vagina

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Since it is rare for the lower 3 to 3½ inches of the vagina to be lacking while the upper part and the uterus, Fallopian tubes, and ovaries are well developed, this case and its treatment are described for the possible help which they may afford to any who may encounter a similar condition.

An unmarried Hindu girl, 17 years of age, had had no periods nor any discomfort suggesting cryptomenorrhoea. When no vaginal orifice could be discovered both she and her relations were greatly distressed.

She was slightly built but well made, and the secondary sexual characteristics were Nothing abnormal was well marked. found on examination until the vulva was seen. The urethra was found to be rather patulous, but behind it was an expanse of vulval skin reaching as far as the perincum. No dimple was to be seen where normally the vagina should have opened, nor was there the purple bulge characteristic of the so-called "imperforate hymen." rectum the examining finger could reach the lower part of a soft, boggy, spheroidal swelling, estimated to be about 2½ to 3 inches in diameter. It was thought to be most probably a haematometra or haematocolpos of the upper part of the vagina

On 21st November, 1947, under spinal analgesia (heavy Nupercaine) she was placed in the lithotomy position. The right index finger, wearing 2 gloves, was put in the rectum, and an assistant held a metal catheter in the urethra and bladder. A transverse incision was then made where the vulval skin met the perineal. Despite

a very limited experience of this dissection, I would suggest that it is wise to make one's incision here rather than further forward. By moving about the catheter one may feel that the bladder comes back rather farther than one expected, and an incision in the vulva, it has seemed to me, might injure the bladder. As the incision was carried a little deeper, the knife was discarded and the left index finger (I am left-handed) was used to burrow between the rectum and the bladder. This was both bloodless and very easy, as had been my experience before when performing Baldwin's operation: neither rectum nor bladder seemed to be in any danger and the tissues between gave way smoothly. When my finger had gone as far as it could, the lower part of the spheroidal swelling could just be reached. The right finger was now withdrawn from the rectum and the outer glove removed. Both fingers were now used to enlarge the track just made between bladder and rectum. It was some 3 to 3½ inches in length and not more than about 5 minutes were required to establish it.

The abdomen was then opened and the Trendelenberg position adopted. The ovaries, Fallopian tubes, and uterus looked well developed and normal, but deep to the uterovesical pouch and in front of the pouch of Douglas could be felt the swelling, which was now obviously a haematocolpos of the upper vagina. The peritoneum of the uterovesical pouch was now incised, as in lower segment Caesarean section, and after the bladder had been pushed away from the cervix and the haematocolpos

itself, the lowermost part of the latter could eventually be reached. A second assistant now pushed 2 fingers into the space previously dissected from the perineum. I could feel them easily, but they were covered by a firm layer of fascia which I took to be that of levator ani. This was opened by cutting down on to her fingers, and the hole so made was enlarged laterally by snips of the scissors.

The problem was then how to connect the haematocolpos with the vulva through the track just dissected? It occurred to me that the haematocolpos, when its contents were evacuated, would, if pulled upon from below, change its shape from the spherical to the cylindrical and thus elongate. thought at first that the lowermost part should be incised, and this would have necessitated an extensive dissection both posteriorly and laterally in order to free it sufficiently to pull it upwards and forwards for the knife to enter at the appropriate place. Such a dissection would almost certainly have resulted in an encounter and possibly an unpleasant one-with the uterine vessels and ureters. I therefore made a transverse incision as low down as possible along the antero-inferior aspect of the haematocolpos and enlarged it to about  $\mathbf{I}_{4}^{1}$  inches. This means that the posterior wall of the vagina would be longer than the anterior-the normal state of affairs. The chocolate fluid found in a haematocolpos escaped when the incision was made, and was mopped up. To the posterior-inferior lip of the incision just made were now threaded 3 traction sutures of catgut: to the anterosuperior lip, 3 of linen thread. All were taken, each in turn as it was passed, by the second assistant between the jaws of a pair of artery forceps which she had passed along the track and were seen presenting through the hole in the levator fascia. The margins of this hole were now held by tissue forceps while the traction sutures were used to pull the vagina through and down towards the perineum. The assistant reported that the vagina seemed to be coming well down. After sewing the floor of the uterovesical pouch of peritoneum, the abdomen was closed.

When the lithotomy position was resumed, the anterior and posterior lips of the vaginal incision were easily identified from the different sutures (linen thread and catgut respectively) attached to each, which had been used to pull the vagina down between the rectum and bladder. These two lips came snugly to the perineal incision and were attached thereunto by interrupted catgut sutures. This was effected the more easily because the incisions in the vagina and perineum were each about 14 inches.

An examination per vaginam with 2 fingers was now easy, and the anatomy felt normal. Inspection showed an unusually long vestibule and a transverse slit for the vaginal orifice. A light pack was inserted in the vagina and allowed to remain for 48 hours in case any oozing occurred. Throughout the operation only 3 vessels had been tied, all in the fat of the abdominal wall.

From the surgical point of view there was a completely uneventful convalescence, but there was a temperature of 102°F. on several occasions, with a leucopaenia. No cause for this was discovered, but it settled down immediately when paludrine was given.

On 12th December the patient was seen again for the first time after she had left the nursing home. One finger could be inserted into the vagina with ease, and 2 fingers with slight difficulty, since there had been a little contraction of the fibrous ring by which the vagina had become attached to the perineum. A Sims's speculum could be introduced easily and the cervix seen. Coitus should not be difficult and parturition ought certainly to occur per viam

naturalem, if the new vagina may be so described.

A normal and painless period lasting for a days began on 20th December.

It is noteworthy that no history of periodic discomfort was given such as one would expect with cryptomenorthoea. Had there been such symptoms the girl would have reported earlier, when the haematocolpos would have been smaller. To perform the operation as described above might then have been difficult or impos-

sible. Would it not be good strategy, therefore, should such a case be met with, to wait deliberately, despite the monthly pain, for a small haematocolpos to become stretched into a larger one by successive menstruations? The danger of rupture, I imagine, would be remote, as a haematocolpos is well known to be able to stretch enormously. I must admit, however, that the point is not one which had occurred to me before I operated, and I was no doubt lucky to find what vagina I did.

### Haemoglobin Values in Pregnant Women

 $\mathbf{BY}$ 

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THE amount of haemoglobin in the blood seems to be a useful gauge of the nutritional status. Unfortunately, much material accumulated in previous years has become obsolete for lack of proper standardization, since simple and reliable methods have only recently become available (King, Gilchrist and Delory, 1944; Nutrition Society, 1945; Macfarlane, 1945).

Since the survey conducted by the Medical Research Council (1945) other recent papers have amplified our knowledge (Young, King, Wood and Wootton, 1946; Roscoe and Donaldson, 1946).

The present survey was conducted with a view to obtain some insight into haemoglobin levels occurring in Palestine, and to determine whether significant differences exist among different groups of the population. The women examined fall into 2 main groups according to their origin. While the first group (Ashkenazim)\* comprises Jews of central and eastern European extraction, the latter group (Semitic) is composed of the following: (1) Sephardic Jews<sup>†</sup>, from countries bordering on the Mediterranean basin. (2) Yemenite Jews. (3) Kurdish Jews. (4) Less well defined smaller oriental communities. Ashkenazic girls, in general, marry later and have fewer children than do those in the Semitic group. (Table I.)

In order to get some idea of the haemoglobin levels in young and physically fit women, living on a well-balanced diet, a group of student nurses of the H. Szold School of Nursing, Jerusalem, was investigated as well. All the students have their meals in their quarters.

The material proper was sampled at random from visitors to the centres for prenatal care in Jerusalem between March and August 1946. Blood was taken from the fingertip (in duplicate); all pipettes used were calibrated by weighing mercury, and standardization was performed with haemin‡, using a photoelectric colorimeter. Thus our figures may be directly compared with those of Young, King, Wood and Wootton (1946).

Our controls (student nurses) had a mean age of 20.28 ( $\sigma$ =1.99) years and a mean haemoglobin level of 13.96 ( $\sigma$ =0.709) g. This latter figure compares favourably with similar data from Edinburgh (Roscoe and Donaldson, 1946) (13.7 g.) and from Aberdeen (Fullerton, Mair, and Unsworth, 1944) (13.1 g.) respectively. All except 4 of our 61 student nurses are Ashkenazic.

In order to facilitate comparison, we chose class intervals and groups like those of Young *et al.* (1946). Table I gives age and parity.

<sup>\*</sup> Ashkenazic is a term loosely used for Jews of eastern European extraction.

<sup>†</sup> Sephardic means Spanish.

<sup>†</sup> The authors wish to express their sincerest thanks to Professor E. J. King for a sample of standardized haemin.

Tana. 1. Number and Age of Women, and Number of Previous Buths.

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Origin	Number	Mean	Standard deviation	Mean	Standard deviation
Ashkenaric Semitic	187 745	29.05 27.30	9 5.77 9 6.12	1,0 <sup>4</sup> 5 2,018	σ 1.101 σ 2.91

Incidence of cases of anaenna.

From the figures of the present survey (see Table 11) it may be seen that gross anaemia did not occur among our patients. Cases having haemoglobin values lower than 70 per cent on the Haldane scale (i.e., less than 10.36 g.) are considered to be anaemic. Our anaemia incidence is slightly lower than that reported by Young et al. (1946). Compared with findings of the survey conducted by the Medical Research Council (1945) our incidence (p. 0.03) is significantly lower in the first two trimesters 15.8 per cent (M.R.C. Survey), and 2.54 per cent (ours), respectively]. In the last trimester the difference in percentage incidence is still higher [8.5 per cent (M.R.C. Survey), and 2.50 per cent (ours)] but. owing to the small number (78) of our cases in this group, the difference does not reach the level of significance (p = 0.08).

### Correlation of Haemoglobin Level and Community.

It will be noted that our oriental group in early pregnancy has the same haemoglobin value (12.36 g.) as Group "A" of Young et al. (12.3) (p = 0.62) while our Ashkenazic Group (12.56 g.) has distinctly higher haemoglobin values (p=0.03). Up to the 6th month our Ashkenazic (12.56 g.) are significantly superior (p=0.03) when compared with the corresponding Semitics (12.36 g.). This may be due to the better economic condition of the Ashkenazics. Our pregnant women in the last trimester pooled (12.22 g.), had far better haemoglobin values than those reported by Young ct al, (11.6), p being less than 0.000,0001. On the other hand, the difference in this group between Ashkenazics (12.2) g.) and Semitics (12.21 g.) is no longer significant (p=0.88). No explanation can yet be given for this observation.

Correlation of Hacmoglobin Level, Length of Pregnancy, Parity, and Age.

It has repeatedly been claimed that haemoglobin levels are lowered by previous births. This is rather difficult to prove, as a greater number of pregnancies is bound to occur with increasing age. Age seems to be the prevailing factor, at least in our Semitic group in the first two trimesters of pregnancy; for, when comparing primiand secundiparae aged 18–25 years (12.51 g.) with a similar group aged 25–35 years (11.93 g.), the difference is significant (p=0.045).

But parity exerts some influence as well, and this is demonstrated mainly in our Semitic patients during their last trimester. Whereas there is no significant difference during the first 2 trimesters between primiand secundiparae (12.38 g.) on the one hand and multiparae on the other (12.33g., p=0.71), the difference becomes significant in the last trimester (I and II parae 12.50g., multiparae 11.88 g., p=0.025). Table 11 shows that, taken as a group, Semitic women show only a slight decrease in haemoglobin during pregnancy (from 12.36 to 12.21 g., p=0.77). Sub-grouping, however, reveals a significant fall in haemoglobin in Semitic multiparae. We have calculated partial coefficients of

TABLE II.

Hacmoglobin Levels Classified According to the Stage of Pregnancy, and According to Community.

	Up to ar	p to and including the sixth month				eventh month to term			
Haemoglobin			Ashkenazic	Per			Ashkenazic	Per	
g/100 ml.	Ashkenazic <sup>,</sup>	Semitic	and Semitic	cent	Ashkenazic	Semitic	and Semitic	cent	
7.9- 8.6							<del></del>		
8.7- 9.4	0	2	2	0.565					
9.5-10.1	I	3 -	4	1.130	I	О	I	1.282	
10.2–10.9	2	II	13	3.675	О	5	5	6.410	
11.0-11.7	27	44	71	20.050		5	14	17.950	
11.8-12.5	39	60	99	27.950		9 8	<b>2</b> 5 .	. 32.050	
12.6-13.2	<b>3</b> 9	49	88	24.850	II	8	19	24.350	
13.3-14.0	· 26	33	59	16.670	5	5	IO	12.820	
14.1-14.7	9	6	15	4.240		I	3	3.845	
14.8-15.6	0	3	3	0.848	О	I	I	1.282	
15.7-16.4									
Total	143	211	354		44	34	78		
Mean	12.56	12.36	12.44		12.23	12.21	12.22		
Standard deviation	on 0.842	0.956	0.918		0.8057	1.02	0.905		

correlation between age, parity, and haemoglobin but these have proved not to be significant.

### SUMMARY.

I. Mean haemoglobin levels in pregnant women in Jerusalem are 12.44 ( $\sigma = 0.918$ ) g. up to the 6th month and 12.22 ( $\sigma = 0.905$ ) g. in the last trimester of pregnancy.

2. Pregnant women from Semitic communities in Palestine have lower haemoglobin levels than comparable groups of Ashkenazic women, mainly during the first and second trimesters.

3. For one group of Semitics it was shown that increasing age, irrespective of parity, depresses the haemoglobin level.

4. Student nurses in Jerusalem exhibit slightly higher haemoglobin levels [13.96]

 $(\sigma=0.709)$  g.] than comparable groups in Edinburgh and Aberdeen.

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### Fibromyoma of the Fallopian Tube

BY

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The Fallopian tube is a rare site of tumour formation, and Dietrich (1922) has stated that amongst the rarest of all such neoplasms is the fibromyoma. Various anthors have commented on the disparity in the incidence of fibroids in the tube, and in the adjacent uterus, particularly in view of the common origin of the two organs from the Müllerian ducts stressed by Quenn and Longuet (1901) and by Kopf and Fukas (1938). These authors have been at a loss to explain this disparity although Clivio (1939) points out the relative quiescence of Fallopian tube as compared with the extreme cyclical changes undergone by the uterus both during menstruation and more particulary, of course, in pregnancy, and suggests that this probably explains the greater tendency in the latter organ to neoplasia.

Scharlieb, quoted by Kopf and Fukus (1938) estimates that the relative proportion of fibroids in the tube to fibroids in the uterus is 1 to 100, but Clivio (1939) denies this and points out that the universal literature over a period of over 120 years contains 46 cases only of tubal fibroid and that the proportion of these uterine fibromyomata is infinitesimal.

The first reported case appears to have been that of Baillie (1818) and cases have been reported at intervals ever since in various parts of the world.

The macroscopic appearances vary very widely in the recorded cases, the size of the tumours varying from that of a grain of rice to that of a foetal head and the number varying from a single tumour to numerous small granulations. The tumour is more commonly single. The situation of the tumour may be in the wall of the tube, projecting into the hunen of the tube, subserons, or pedinculated and Pilliet (1894), Lwoff quoted by Pozzi and Jayle (1907), and Taylor (1896) described concentric tumours surrounding the tube. Kopf and Fukas (1938) state that the tumour arises most commonly in the pars interstitialis and that a tumour arising from the ampulla is less common. In the recorded cases the tumour has usually been found on the left side. Cystic degeneration has been noted by Le Dentu (1800) and Auvray (1012), and purulent change by Thomas (1881). Calcification has been reported by Barette quoted by Poret (1898) and by Ballantyne, quoted by Allbutt, Playfair and Eden (1906). Clivio (1939) suspected sarcomatous change in one of his cases. Myxomatons degeneration has been observed by Kopf and Fukas (1938) and by Percival (1929). Pastorini (1936) distinguished nodular, fascicular and plexiform types according to the histology, but this distinction appears to serve no useful purpose. The histological appearances are similar to those found in uterine fibroids with varying proportions of fibrous and muscular tissue arranged in whorls. Rudolph (1898) has described a case in which fibrous tissue only was present, i.e., a pure fibroma. Pastorini (1936) and others have pointed out the frequent co-existence with uterine fibromyomata.

Diagnosis. Diagnosis is extremely difficult and Auvray (1912) states that it has never been made prior to operation. There is no symptom which is pathognomonic and it may be confused with a fibroid of the uterus or tumours of the ovary, broad ligament, bladder or greater omentum as well as with inflammatory disease of the tube. Pastorini (1936) points out that it is difficult to decide the precise point of implantation of such a tumour, especially in the presence of uterine fibroids or other lesions of the adnexa, and he confirms Auvray's opinion of a quarter of a century earlier that a preoperative diagnosis is never made.

Symptomatology. Symptomatology is not characteristic. Generally speaking clinical examination reveals a swelling of the Fallopian tube which is hard, smooth, mobile, and painless and not affecting menstruation. Quenu and Longuet (1901) describe metrorrhagia in their case but this is by no means a common symptom except in the presence of some lesion other than fibromyoma of the tube. Secondary dysmenorrhoea occurred in Pastorini's case (1936) from the age of 21 years until operation 13 years later, and he points out that, as in his case, dysmenorrhoea may be caused by small fibroids obstructing the lumen of the Dysmenorrhoea has also been described by Clivio with a larger tumour, the size of a mandarin orange, in the region of the right cornu. This was probably not due to encroachment of the tubal lumen so much as to red degeneration which was recognized on section of the tumour after removal. Torsion occurred in the cases described by Cullen and Kelly (1909), Herde (1918), Barette, quoted by Poret (1898), Auvray (1912), Kopf and Fukas (1938). Conditions co-existing with fibromyoma of the tube include uterine fibroids, as, for example, in one striking case described by Peraire (1903) where fibroids were present in the uterus, in both ovaries.

and in both tubes. A tubal pregnancy ruptured at the second month was found in association with a fibromyoma of the tube in Lecène's case (1909), and Semisch (1936) reported a similar case. In this latter case the tumour was possibly responsible for the ectopic situation of the pregnancy. In that described by Auvray (1912) there was a coincident malformation of the Fallopian tube, the tumour being attached to the tube near the cornu by a pedicle which was hollow and lined with an epithelium similar to that of the tube itself, and obviously a diverticulum of the tube. Auvray believed that this was of no aetiological significance in the case in question but purely coincidental. Percival (1929) described a case of tuberculous salpingitis in which the left tube contained in its ampullary part a moderately large fibroid, one part of which showed myxomatous degeneration. In this case the symptoms of malaise, loss of weight, night sweats, etc., were obviously due to the tuberculous process. In Auvray's case there was a hydrosalpinx on the affected side as well as multiple uterine fibroids.

The treatment of the con-Treatment.dition is essentially surgical. (1936) points out that it is impossible to make a diagnosis and that, even if it were made, in view of the situation and the usual mobility of the tumour it is impossible to apply radiotherapy satisfactorily. He also stresses the importance of conservatism in treatment. If the tumour is pedunculated myomectomy is usually easy, but sessile tumours may demand salpingectomy and associated conditions may require more extensive intervention. Laparotomy is indicated sometimes as an emergency operation in cases where torsion of the pedicle has occurred, giving rise to the symptoms commonly associated with torsion of any abdominal tumour.

The results of treatment in the reported



Fig. 1.

Shows attachment of Fibromyomatous tumour to Fallopian tube.

J.A.C.



cases have been uniformly successful, symptoms having been relieved and all the patients having recovered, although a number of the earlier cases reported were only recognized at postmortem examination.

Clivio, in 1939, was able to collect 40 cases of fibromyoma of the tube and 1 further case has been reported by Munoz Ferrer and Ucelay Cambreleng (1945). I have been unable to obtain a copy of the last-named report, but it appears that this is the only record of the condition to have appeared during the war years. The case described below I believe to be the 48th recorded in the literature, and the infrequency of the condition is such that this paper appears to be justified.

### CASE RECORD.

Mrs. J. M., aged 45 years, was admitted to the Royal Northern Infirmary, Inverness, on 7th July. 1947. She gave a history of one normal pregnancy 25 years ago, following which she had been sterile. No cause for this had been discovered. Occasional frequency of micturition had troubled her for about a year past. Following sea-bathing on 1st July she suffered from pain in the lower abdomen and vomiting, followed by diarrhoea with persistent suprapubic pain. Her temperature was 99°F., pulse, 84, respiration 20. On examination of the abdomen there was some suprapulic tenderness and a solid tumour could be felt arising from the pelvis to a height of 3 finger-breadths above the symphysis pubis, firm, of limited mobility, and more or less central in position. It was slightly tender and appeared to be a uterine fibroid. The condition was diagnosed as torsion of a pedunculated uterine fibroid and immediate laparotomy was undertaken. Under general anaesthesia with pentothal, cyclopropane and tubarine a midline subumbilical incision was made and revealed that the mass in the abdomen consisted of oedernatous omentum wrapped around a tumour arising from the left uterine appendage. The omentum was separated without difficulty and the tumour identified as a pedunculated fibroid arising from the middle third of the tube which had undergone

torsion through 112 complete turns in a clockwise direction.

The torsion was undone and the tumour, together with the corresponding tube, was removed. The le't ovary was healthy and there was no evidence of any other disease in the pelvis. There were no uterine filmoids. The patient made an uninterrupted recovery and was discharged from hospital on 10th July. When she reported on 8th September the was completely symptom-free and her general and local condition were satisfactory.

The pathological report (Dr. H. J. Kirkpatrick) was as follows:

Macroscopically, the tumour measures  $4 \times 3 \times 2$  ms. (10 × 7.5 × 5 cm). The cut surface shows solid haemorrhagic areas with small cysts, and about two-thirds of the growth is solid, whitish and rather homogenous in appearance.

Tissue from the solid white area. Sections show benign fibromyomatous tissue. There are some areas of oedema with separation of the structures of the tumour tissue. Mitoses are scanty and the structure is regular and without variability in the size of the cells which are of benign type.

Tissue from the solid haemorrhagic area. Sections show benign fibromyomatons tissue. Vessels are engorged and there is haemorrhage with disorganization of the tumour tissue. There are areas in which the tumour is undergoing necrosis.

Tissue taken from the wall of a cyst. The wall is formed by degenerate fibroid tissue and the cyst contains fibrinous fluid. Vessels are engorged, there are areas of haemorrhage, and areas of polymorphonuclear infiltration.

### DISCUSSION.

This case illustrates the impossibility of diagnosis of tubal fibromyoma, which has been pointed out by so many authors. The symptoms of abdominal pain, associated with a swelling and following unusual physical exertion, were sufficiently characteristic of torsion of a tumour to lead to a diagnosis of twisted uterine fibromyoma but there was nothing whatever to indicate the exact point of origin of the tumour. This patient previously showed an unusual

symptom, namely frequency of micturition, doubtless due to the pressure of this considerable tumour on the upper surface of the bladder. In this instance the removal of the Fallopian tube, as well as of the tumour, was not strictly necessary, but in a woman of this age it appeared that further pregnancy was not likely and that conservation of the tube was therefore of little importance.

### SUMMARY.

- (1) The literature dealing with fibromyoma of the Fallopian tube is discussed and a personal case described.
- (2) Symptomatology is not characteristic and accurate diagnosis impossible.
- (3) Treatment is by laparotomy, and removal of the tumour as conservatively as possible.
  - (4) Prognosis is good.

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## Investigations into the Determination of Pregnanediol according to the Guterman Method

BY

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PREGNANEDIOL (PD) was first isolated by Marrian (1929) from the urine of pregnant women. It is excreted combined with glucuronic acid and this combination, which presumably takes place in the liver, makes possible its elimination in the urine. PD itself is insoluble in water, whereas the glucuronic acid complex of PD is soluble in water. The sodium salt present in urine, sodium pregnanediol glucuronidate (NaPG), was first synthesized by Huebner, Overman and Link (1944).

PD is considered to be an excretory product of progesterone. Butenandt and Schmidt (1934) were able, by means of chemical processes alone, to convert the biologically inactive compound PD into progesterone. The excretion of NaPG in the urine is increased in pregnancy.

Determination. The original method of determining NaPG in the urine was published by Elizabeth Venning (1937). It is extracted from the urine with butyl alcohol. After a series of purifications and precipitations, it can then be determined gravimetrically. The method is detailed and extremely tedious. Special difficulties are encountered if the urine contains blood or if the quantities of NaPG excreted are small, in which case impurities present in the final precipitate exert a marked influence. From an admixture of a known quantity of NaPG and urine, a content of less than 5 mg. per litre is not, as a rule,

recoverable. If 20 to 25 mg, are added, not more than 70 to 75 per cent may be recovered. Some investigators who have employed the Venning procedure express the quantity excreted in milligrams per day; others convert the values to free PD, a step which involves multiplying the weights of the precipitates obtained by 320/536 = 0.597 (the molecular weight of PD is 320, and that of NaPG plus one molecule of the water of crystallization is 536). Hamblen, Cuyler and Baptist (1942), who have wide experience of the method, state that a result cannot be obtained before 4 days.

The disadvantages inherent in the frequently amorphous precipitate obtained by the Venning method have led to attempts to determine the glucuronic acid content, either by measuring the reduction-capacity of the precipitate before and after hydrolysis, or by direct treatment with Tollen's reagent, which produces a colour identifiable by colorimetry with glucuronic acid.

Astwood and Jones (1941) have described a method of determination based upon an acid-hydrolysis of the urine in the presence of toluene. When boiled together with an acid, NaPG decomposes, forming free PD, insoluble in water but soluble in toluene. When the impurities have been precipitated, PD is recrystallized in dilute alcohol and weighed. This method gives

a maximal yield of 80 per cent of a known added quantity of NaPG and somewhat uncertain values where the content of PD per litre of urine does not exceed I to 3 mg. Approximately 20 per cent of the PD is lost during the acid-hydrolysis.

In 1944, Guterman described a rapid method for determining PD in urine, which would be of special value as a test for pregnancy. It is based on the toluene extraction of the acid-hydrolized NaPG in the urine, followed by the precipitation of the PD, whereupon the precipitate gives a colour reaction with concentrated sulphuric acid—orange to a deep orange-brown being positive, while a colourless or light yellow solution is negative.

It is maintained upon the following grounds that the resultant colour is specific for PD:

- T. The absorption-curve shows a maximum at 430 millimicrons, identical with that produced if PD and NaPG are added to male urine which is subjected to the same procedure. The addition of oestriol, oestradiol, cholesterol or androsterone does not give a colour-complex with this absorption-frequency.
- 2. The precipitate which gives the colour-reaction has a melting-point identical with that of pure PD and does not reduce the melting-point of pure PD.

According to Guterman (1944), the test takes 3 hours and 4 to 6 specimens may be tested simultaneously. A positive colour-reaction indicates that 1 or more milligrams of PD are present in every 100 ml. of urine used and this in the presence of amenor-rhoea is said to indicate a normal pregnancy.

In a later report Guterman (1946b) states that the minimum for the positive colour-reaction must show a deep yellow which corresponds approximately to 0.4 mg. PD for every 100 ml. of urine, and an excretion of 6 to 10 mg. of PD in 24 hours.

Morrow and Benua (1946) read off the colour of the Guterman test in the colorimeter. They use a filter which transmits between 500 and 570 millimicrons, but have been unable to obtain reproducible colorimeter values in their attempts to add pure PD to specimens of male urine. At 500 millimicrons, however, a solution of PD in concentrated sulphuric acid shows scarcely any colour-absorption. The maximum colour-absorption occurs at 420 to 430 millimicrons (Guterman, 1946a). Reinhart and Barnes (1946) estimate the colour-intensity by comparisons with a solution of potassium chromate.

The subjective nature of the colour estimation in the Guterman method, which involves certain disadvantages, should be supplemented by colorimetric reading within an appropriate range of wavelength. The rate at which urine is secreted during the night varies considerably and must be taken into account. With a large quantity of urine, only a small proportion of the day's quantity of PD is determined in 100 ml. of morning urine.

If the excretion of PD is relatively high, even a somewhat substantial decrease in the excretion will still yield a positive reaction with the Guterman test. The attempts which have been made to show that a fall in the excretion of PD prognosticates miscarriage are bound to be doubtful as long as the method is merely qualitative.

In the Department of Gynaecology and Obstetrics at Lund, where the Guterman method for the determination of PD has been tested, a colorimetric evaluation of colour and an allowance made for the quantity of urine have rendered the method quantitative, so that the measurement of the daily excretion of PD may be made simultaneously with the judging of the test as positive or negative. The method has been tried in a total of 430 determinations

in 338 cases. All urine passed from 8 p.m. to 8 a.m. was collected and from this measured quantity, 100 ml. were used in analysis according to the Guterman technique.

Work on the determination of PD was generally begin straight away in the morning when the possible decomposition of NaPG by urinary bacteria could hardly have taken place (Wooster, 1942). Any precipitate present in the urine was spin away before the specimen was analyzed. The troublesome "three-fold stratification" which often occurs at the toluene-washing (stage A5 of the method) if the urine is albuminous or contains blood can be removed by suction-filtration through a glass filter which is afterwards washed with toluene.

The subjective estimation of colour was supplemented by a colorimetric procedure, using a Pulfrich photometer with filter S43 and cuvettes with 0.5 cm. depth of sulphuric acid. The colour absorption of S43 occurs at 430 millimicrons and gives the greatest extinction, E, for the colour of PD with sulphuric acid. The average of 6 colorimetric readings was used. The specimens, which were estimated subjectively as clearly negative and clearly positive respectively, in 269 cases with filter S43 gave E' < 0.325and >0.360 respectively. In the middle lies a transition region where the specimen, with regard to its colour-intensity, is not conclusive in either a "positive" or a "negative" direction. A number of specimens, judged subjectively as doubtful, were grouped beyond these extinction boundaries. Some results which fell between E' < 0.325 and > 0.360 were assigned to an "uncertain" group and denoted possibly G-negative.

Colorimetry was carried out as quickly as possible after the reaction between PD and sulphuric acid had taken place. If left for some hours the specimen is often seen

to be darker in colour and more fluorescent, even if it has been stored in a dark place.

Because of the scarcity of pure PD, the calculation was with relative values, in units per day  $\frac{E \times u \times 2 \times 100}{100}$  (u = the quantity of night urine, multiplied by 100 to avoid the decimal point).\*

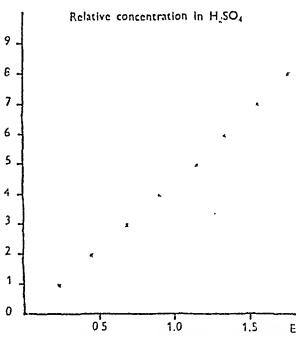


Fig. 1. Dilution of a solution of intense colour with concentrated sulphuric acid, relative concentrations 1, 2, 3, 4, 5, 6, 7, 8.

Beer's Law, which states that a direct proportion exists between the values of concentration and extinction, is valid for the colorimetric procedure described.

In order to assess the reliability, parallel determinations with complete series of analyses were carried out on two different specimens of urine. The following values were obtained, expressed in units per day:

Urine 1. 13, 8, 16, 13, 7. Total result

<sup>&</sup>lt;sup>\*</sup> This method was described by the author at the South Swedish Gynaecological Conference on 31st August, 1946. It has also been employed by Genell and Jensen (1947).

John 3 "

negative according to Guterman. Maximal divergence from the mean  $\pm 4.4$ . Relative error 40 per cent.

Urine 2. 139, 150, 139, 143, 153. Total result negative according to Guterman. Maximal divergence from the mean ±8. Relative error 5 per cent.

Although the method, as was anticipated, was most unreliable with small excretions, it shows relatively slight errors with excretions round about 150 units per day. Nevertheless, there is an appreciable factor of uncertainty. By experiments in dilution it is shown that with diminished PD-concentration one sometimes incurs losses in the quantities recovered which exceed the divergences given above to a considerable extent (Genell and Jensen, 1947). In 4 out of 10 experiments conducted personally, these have been confirmed. That the recovery percentage of NaPG decreases with diminished concentration was also discovered by Venning (1937) and, for this reason, it is a source of error even with gravimetric, quantitative methods of determining PD.

If specimens of urine that are received continuously throughout the day by means of a self-retaining catheter are analyzed, Guterman negative results may suddenly appear in the case of an otherwise positive pregnancy, and the excretion measured in units per day may fall considerably. In 2 out of 3 cases examined, such variations were established. An example from a

TABLE I.

	uantity f urine	Guterman test	PD excretion
(ml.	per hour)		(units per day)
3-6 р.т.	47	positive	1198
6-10 p.m.	44	positive	628
10- 1 a.m.	58	positive	762
I- 4 a.m.	41	negative	245
4~ 7 a.m.	57	positive	967
7-10 a.m.	85	negative	304
10-12.30 p.m.	56	negative	305
12.30-2.30 p.m	. 83	negative	200

patient in the 9th month of pregnancy is shown in Table I.

Several investigators emphasize the considerable variations in the excretion of PD in the same woman as well as those found in different women in different physiological and pathological conditions (Buxton, 1940; Müller, 1940).

### CLINICAL USE.

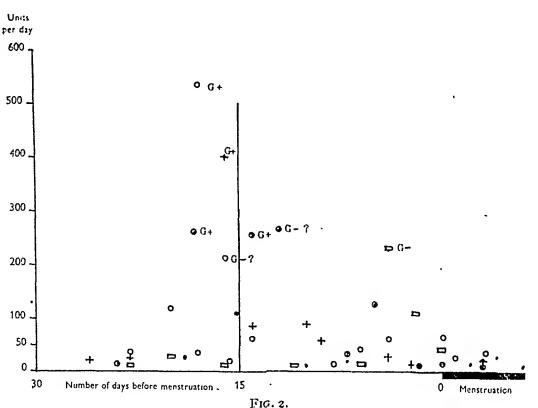
The excretion of PD under physiological and pathological conditions has been studied on the assumption that a quantitative measure of this excretory product would correspond with the output of progesterone in the corpus luteum. This assumption, however, presupposes amongst other things that PD is formed only when progesterone decomposes. This is definitely not the case. PD may also be formed even when other closely-related steroids split up.

With tumours of the suprarenal capsule an abundant excretion of PD has some-(Finkler, 1941; times been observed Talbot, Butler, and Berman, 1942). Sometimes PD is found present in the urine both of men and of castrated women (Hirschmann, 1940), when it is assumed to be produced from desoxycorticosterone (Cuyler, Ashley and Hamblen, 1940; Engel, Thorn and Lewis, 1941). For, if suprarenal hormone is injected subcutaneously into a rabbit, 7 to 20 per cent of it may be recovered in the urine as PD. Scarcely more may be recovered if pure, crystalline progesterone is injected into women during the folliculin phase. Indeed, according to some research workers, hardly any PD is recovered from the urine of women even though large quantities of progesterone have been injected (Hamblen, Ashley and Baptist, 1939). The supplying of progesterone to pregnant women tends rather to reduce the previously existing excretion of PD even if this is low (Hamblen, 1941).

Simonnet and Béclère (1943) have drawn inferences regarding the function of the comus luteum from the excretion of PD which occurs during the menstrual cycle. They consider an excretion of PD of less than I mg, per day from the 7th to the 5th day before the menstrual period as evidence of ovarian deficiency and a quantity of 3 to 8 mg, as excessive functioning of the ovaries. With such small quantities, however, the methods of estimation are uncertain. Furthermore, it is shown that PD need not be excreted at all, despite the fact that the endometrium is converted to the normal secretory phase (Hamblen, ct al., 1942). On the other hand, the presence of PD in the urine does not signify that the endometrium is transformed into the secretory phase (Hamblen, Ashley, and Baptist, 1939). During the luteal phase in the menstrual cycle, quantities of PD averaging 2 to 8 mg. per day were excreted, according to experiments carried out with the Venning procedure (1937). The variations noted in one woman alone, as well as those between different women, are considerable. On certain days there may be a complete absence of PD secretion (Buxton, 1940). Usually, the excretion terminates 1 to 3 days before the period and frequently does not begin until the 9th day before the expected date of menstruation (Stover and Pratt, 1939).

In our laboratory we collected 46 specimens of urine from 5 healthy women between the ages of 20 and 27 years, all with recorded normal menstrual periods with intervals of roughly 28 days, about every 3rd day during approximately one cycle. The specimens were analyzed by the original Guterman method with the quantitative modification given above.

As is shown by the diagrammatic representation, the variations in the excretions



are very considerable. With a PD-concentration in the neighbourhood of 250 units per day, the result became "positive". This, according to Guterman, occurs when the daily excretion is approximately 6–10 mg. of PD. Therefore 250 units equal approximately 6–10 mg. of PD. Altogether 4 specimens out of the 46 were positive.

The highest observed values of PD, apart from those of the 5th to the 2nd day before menstruation, were relatively early in the menstrual cycle, about the 15th day, which might suggest a marked activity of progesterone just when the corpus luteum is beginning to function. The excretion exhibits a certain similarity to that of oestrin, which has its highest peak in the middle of the cycle and a lesser one immediately before the menstrual period (Genell, 1943). During the menstrual period itself, the excretion is consistently low.

In one of the women examined the excretion of PD was relatively low during the whole time and rose on only one occasion to 105 units per day. The highest value observed was 550 units per day.

From 46 patients who had been hospitalized for dysmenorrhoea, sterility and primary and secondary amenorrhoea, specimens of endometrium were taken a day or two after the determination of PD.

with an apparently normal secretory phase; a relatively high value suggests in a somewhat uncertain manner that the endometrium is subject to luteal influence.

The highest observed excretion in the secretory phase, 420 units per day, had a histological picture of an early secretory endometrium. This specimen was Guterman positive (E=0.576). A specimen from the same group of about the same amount quantitatively, 418 units per day, was, on the other hand, Guterman negative (E=0.199). The Guterman test determines the concentration of urine instead of the daily excretion of PD.

One must be very cautious in drawing conclusions regarding the function of the corpus luteum with the guidance of the PD-excretion. Specimens ought to be taken rather frequently, as abrupt changes in the excretion occur. One day there may be no excretion at all, another day high values may be obtained. One should, however, be able to state that the absence of PD, or a very small excretion, <50 units per day, in several tests indicates that the activity of the corpus luteum is slight.

After the climacteric, the excretion, as is to be expected, is low. In 13 cases examined, the excretion varied between 1 and 101 units per day. On the average, 20 units per day were excreted.

Table	

	Number of cases	Stage in menstrual cyc	Excretion of PD					
-	18	Proliferative phase	0-182,	averaging	25	units	per	day
	18	Secretory phase	2-420,	averaging	99	units	per	day
	IO	Resting phase	2-243,	averaging	39	units	per	day

The connexion between the excretion of PD and the stage in the cycle is shown in Table II.

The variations are, as shown, considerable. The highest excretion of PD is, however, observed in conjunction with the secretory phase. A low value can be found

It was proposed by Wilson, Randall and Osterberg (1939) to utilize the increase in the excretion of PD as a chemical test for pregnancy. The excretion of PD during a normal pregnancy is plateau-like for the first months, rather low, at about 5 to 10 mg. per day, but rising up to the 7th month

when a maximum of about 80 mg. in 24 hours is reached. The excretion then remains high until a few days before parturition, when a considerable decline (Bachman, Leekly and Hirschmann, Browne, Henry and Venning, Portes, Simonnet and Robey, 1941) is said to occur, but which is absent in several cases (Bachman, 1941; Stover and Pratt, Even during pregnancy there 1030). are large variations in the excretion of PD (Cope, 1940). Thus the maximum from the 8th to the 9th month may swing between 30 to 120 mg. per day. On the 5th day after childbirth, the excretion of PD has frequently fallen to quite insignificant values (Bachman, ct al., 1940).

The relatively low concentration of PD during the first months of pregnancy is related to the production of progesterone in the corpus luteum of pregnancy. Afterwards, the placenta is considered to account for the increased production of progesterone, with rising values of PD, while the corpus luteum is gradually degenerating (Gillman and Stein, 1941).

Hence, when at the beginning of pregnancy the excretion is stated to lie only slightly above the level reached during the luteal phase in the menstrual cycle, an early diagnosis of pregnancy must necessarily be difficult.

Guterman (1944) reports, however, that with his qualitative method alone, he is able to diagnose pregnancy with a high degree of certainty. In a collective survey in 1946 he found a positive verdict in 116 cases out of 124 normal pregnancies, sometimes as early as 5 days after the first menstrual period had been missed. A negative verdict was given in 106 cases among 115 non-pregnant patients with amenorrhoea. McCormack (1946) found a decided agreement between the original Guterman method and Friedman's pregnancy-reaction. Morrow and Benua (1946), who use

one of the modifications criticized by Guterman, reject the method as a test of pregnancy. They examined, however, only about 50 cases. Their most important observation was that normal non-pregnant women sometimes gave a positive reaction during the luteal phase of the menstrual cycle. In view of the fact that the excretion of PD during the luteal phase sometimes reaches quite high values, it is natural that the test then may be positive. It is also significant that Guterman insists on amenorrhoea, as well as a positive reaction, to give a diagnosis of pregnancy.

Reinhart and Barnes (1946) found an error of about 25 per cent with the Guterman method. Noreby (1947) states that in some cases of salpingo-oöphoritis following septic abortion, there may be a high excretion of PD.

With Sr healthy, pregnant women, 89 Guterman tests produced the results'shown in Table III during the different months of pregnancy compared with the quantitative determination of the excretion of PD.

The excretion of PD during the first months of pregnancy is often insufficiently high to give a positive result. Even if the limit for the quantitative excretion is set as low as that of 50 nnits per day, several specimens in the earliest months fail to reach this level, which, on the other hand, is often met with in the case of non-pregnant patients with amenorrhoea. Even the quantitative measurement of the excretion of PD cannot be used as a method in the early diagnosis of pregnancy.

Not until the later months of the pregnancy, when the excretion increases, is the Guterman test more constantly positive. The negative reactions reported during the last month of pregnancy may sometimes possibly refer to the fall already alluded to in the excretion of PD before parturition occurs.

The average for the excretion of PD rises

TABLE III.

				Excretion	on of PD
Amenorrhoea in months	Number of specimens	Reaction with negative	Guterman test positive	<50 units per day	>50 units per day
2	3	3	0	I	2
3	5	4	I	2	3
4	11	II	O	8	3
5	3	2	τ	0	3
6	2	I	I	r	I
7	8	3	5	0	8
8	7	Ī	6	ı	6
9	10	O	IO	0	JO
10	40	9	31	2	38
Total	89	34	55	15	74

right up to the beginning of the 10th month of pregnancy, only to decline towards the last week before parturition. In the 4th month and the 9th month, the excretion apparently undergoes a temporary diminution. (Table IV.)

The highest excretion of PD observed, 6,920 units per day, occurred in a case in the 10th month of pregnancy. It is seen that very great individual variations in excretion are found with these pregnancies too. If the excretion of one person is followed up after an interval of a day or two, large variations may be found.

Immediately after the confinement the excretion of PD falls and the Guterman test

is positive only sporadically during the week following childbirth (42 specimens in 41 cases). (Table V.)

The highest excretion observed, 975 units per day, was found on the 2nd day following childbirth.

One hundred and seventy-eight specimens from 153 cases examined, suffering from various gynaecological complaints (amongst them a majority with secondary amenorrhoea) yielded 4 positive reactions to the Guterman test.

With certain tumours, for example, cancer of the suprarenal capsule, the excretion of PD sometimes shows high values. This, however, can be of value in the diagnosis of

TABLE IV.

umenorrhoea in months	Number of specimens		Excre	etion	of `PI		
2	3	6-63,	average	43	units	per	day
3	5	7-528,	,,	157	,,	,,	",
4	11	0-527,	- ,,	70	,,	,,	"
5	3	62-1105,	,,	412	,,	,,	,,
6	2	28-879,	,,	454	,,	,,	"
7	8	85-1616,	,,	510	,,	,,	,,
8	7~	30-1760,	,,	875	,,,	٠,,	,,
9	10	192-1609,	,,	639	,,	,,	5,
0, 4-2 weeks before parturition	7	174-6920,	,,	1735	,,	,,	,,
2-1 weeks before parturition	10	42-3722,	,,	1083	,,	,,	,,
6-4 days before parturition	8	53-2025,	,,	742	,,	,,	,,
3-2 days before parturition	9	21-2470,	,,	895	5,	,,	,,
1 day before parturition	6	235-2452,	,,	870	,,	,,	,,

TABLE V.

Days after parturition	Number of specimens	ren	erman ection negative	Excretion of PD in units per day (average)
 1 2	15	o 2	4 ) 6 )	166
3	5	1	5 }	73
5 6	7 7	o 3	7	98
7	2	o	2	33

these tumours, where clinically it ought to be fairly simple to exclude pregnancy. A positive Guterman reaction is certainly not to be identified with pregnancy without further data, any more than a positive reaction to the Friedman test. Both must be related to the clinical findings. The first indicates an increase in the excretion of PD, the second an increased excretion of prolan.

The positive proof of pregnancy with the Guterman test is apparently a great deal more certain than the negative exclusion of pregnancy. A positive Guterman reaction plus amenorrhoea indicates a strong probability of pregnancy. A negative Guterman reaction plus amenorrhoea does not, on the other hand, exclude pregnancy.

In patients with pre-eclamptic toxaemia there is sometimes found a diminished excretion of PD even to the extent of its complete absence from the urine (Browne, Henry and Venning, 1938; Weil, 1938). There has been a desire to explain this as a deficiency in the conversion of progesterone, or as due to a defective functioning of the kidneys, which would prevent the normal excretion of PD. It is difficult to extract PD from urine containing albumin, and that might involve a source of error.

Sixteen specimens, from 13 cases of pregnancy with symptoms of pre-eclamptic toxaemia, exhibited somewhat lower values than those of normal pregnancies. No

distinct relation between the seriousness of the symptoms and the result of the reaction was found. (Table VI.)

The excretion of PD should be low in cases of threatened miscarriage which later become inevitable. Opinions differ, however, with various writers on the subject. Negative or low values do not necessarily mean that miscarriage is mavoidable (Hamblen, 1941). cording to Ostergaard (1940), miscarriage can occur without there being any decrease in the excretion of PD beforehand. In 12 cases Hamblen, Cuyler and Baptist (1012) found a certain relation between the excretion of PD and the risk of miscarriage. All those cases where the excretion of PD was low initially, and continued to be so, miscarried in spite of intensive progesterone therapy which was quite incapable of inducing a higher excretion of PD. No patient who excreted normal quantities of PD miscarried. Contrary to this, Hain (1942) in an extensive series of investigations, found that many patients miscarried despite a normal excretion of PD, and that quite a number of pregnancies continued normally despite the fact that the excretion of PD was extremely low and periodically ceased altogether. With his qualitative test Guterman (1946b) stated that in 73 cases of threatened miscarriage, the prognosis had been as high as 93 per cent correct.

TABLE VI.

Amenorrhoea in months	Number of specimens		erman etion positive	Average excretion of PI in units per da	
3	3	2	I	190	
4	ī	1	0	-	
5	· 0	_	~-	124	
6	1	1	0	126	
7	2	2	0		
8	1	ı ·	o i	41 328	
9	4	2	2	490	
10, 4-2 weeks before parturition	2	I	ī	235	
2-1 weeks before parturition	I	O	ī,	732	
6-4 days before parturition	- 1	1	0	0	

Just as the Guterman reaction is extremely unreliable in cases of normal pregnancy, especially during the early months, its application in assessing the prognosis in threatened miscarriage must be uncertain, too, and it has been possible to verify this. In II threatened miscarriages in the and to 7th months, where the pregnancy continued undisturbed, 4 were positive and 7 negative. Among 6 cases in the 2nd to 4th months, where miscarriage took place, 3 specimens were positive and 3 negative. When the quantitative values of excretion vary so considerably in normal pregnancies, the incidence of a low value gives no indication regarding the prognosis of a pregnancy.

On the days following a spontaneous miscarriage, the excretion of PD is very inconsiderable. Seven cases examined showed an excretion which rose at a maximum to 65 units per day.

Where therapeutic abortion was performed in the 2nd to 4th months of pregnancy (10 specimens examined in 7 cases), a positive Guterman reaction could not be established after the operation. The PD content in the urine did not rise above 140 units per day. (Table VII.)

The additional administration of hormones or vitamins can influence the excretion of PD. Stilboestrol increases the

excretion in pregnancy according to Smith and Hurwitz (1946). A 43-year-old woman who was pregnant for the third time was treated with stilboestrol, 5 mg. twice daily for the 4 days before parturition, and had a remarkably high excretion of PD—5,987 units per day on the day before her confinement.

TABLE VII.

	Number of specimens	rea	erman ction negat	ive	Average excretion of PD in units per day
I 2	3	0 0	3	}	69
3 4	2 - 3	0 0	2 3	}	58
5 6 ·	0	- o	 I	}-	. 19

The taking of Vitamin E during the menstrual cycle increases the quantity of PD and the period of time during which it is excreted. The use of Vitamin E in pregnancy does not, on the other hand, inevitably yield an increase in the excretion of PD (Bach and Winkler, 1941).

In some cases of hydatidiform mole, Guterman (1946b) found that the test for PD gave a negative result where there had been at the same time a markedly positive biological reaction of pregnancy. He was

of the opinion that this finding might be of great help in the diagnosis of hydatidiform mole. In 2 cases of hydatidiform mole repeated gonadotrophic hormone and PD determinations were carried out. In both, the Guterman reaction was consistently negative and the excretion of PD low (highest observed value 58 units per day), whereas the excretion of gonadotrophic hormone had been greatly intensified in the beginning and the biological pregnancy test positive. This agrees with Guterman's earlier observations. It is possible that the test may be of some diagnostic value here. These findings are surprising, as most cases of hydatidiform mole are associated with lutein cysts in the ovaries, when one would expect a high excretion of PD.

Two cases of lutein cyst, unassociated with hydatidiform mole, where the excretion of PD was determined a day or two before laparotomy, showed, however, low values—21 and 23 units per day respectively—which indicates a low progesterone excretion in this condition.

### SUMMARY.

Guterman's qualitative method of determining pregnanediol, intended in the first instance to serve as a diagnosis of pregnancy, has been modified so that it permits a quantitative colorimetric estimation of the excretion. It has been tried out in altogether 430 determinations in 338 cases.

Both the original Guterman method and the quantitative measurement of the excretion of PD are uncertain as tests of pregnancy. In roughly 38 per cent the reaction was negative (89 determinations of pregnant cases). The quantities of pregnanediol excreted during pregnancy are often so small that excretions of the same magnitude are often encountered in non-pregnant patients with amenorrhoea. "Positive" reactions may be obtained during the menstrual cycle.

The positive proof of pregnancy is more reliable than the negative exclusion of pregnancy. A positive reaction accompanied by amenorrhoea suggests pregnancy.

In the prognosis of threatened miscarriage the Guterman test is unreliable. In 17 cases examined, a correct prognosis was obtained in only 7.

Two cases of hydatidiform mole and 2 of lutein cyst gave negative Guterman reactions and had low excretions of PD.

By the quantitative modification of the-Guterman method, large variations in individual excretion values were observed during the normal menstrual cycle as well as during pregnancy. Even variations in the same person are considerable.

During the normal menstrual cycle, in addition to excretion being increased in the luteal phase, a peak appeared at about the middle of the cycle in some cases.

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### Facts and Fantasy in the Study of Female Infertility\*

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I have aimed at presenting a brief review of the subject in preference to dealing with one particular aspect of it. To do this I have restudied the first 1,000 cases investigated at the Fertility Clinic, founded in Oxford in 1943.

On reviewing this data I decided to take as the title of this lecture "Facts and Fantasy in the Study of Female Infertility." It should be noted at this stage that the 1,000 cases to which I refer are unselected, excepting in so far as they are the first cases investigated at the Oxford Centre. They consist of 729 nulliparous women and 271 who were complaining of an acquired They include patients whose sterility. pelves were perfectly healthy as well as those who were found to have retroversions, fibroids, ovarian cysts, sepsis, hypoplasia, cervical infections, erosions and polypi. In short, they are an unselected cross-section of the type of patient attending any fertility clinic.

In the first place I would make a plea for a decreasing emphasis on sterility and an increasing one on fertility. This change in outlook is long overdue. We must remember that of every 100 couples who consult us because they desire children, few are sterile. Many will have varying degrees of sub-fertility, but the incidence of absolute sterility is relatively low. This

fact should be noted at the outset, that the incidence per cent of sterility among inquiring couples will decrease as the present tendency increases for couples to seek advice early in married life. Bearing all this in mind, when a worker analyzes his results and finds that 35 per cent of the women who consulted him for sterility have conceived, he discovers a fact; but if he claims that this means that 35 per cent of the women he has treated for sterility have subsequently conceived he indulges in a fantasy, and the fantasy is a dangerous one. It is dangerous because it is inaccurate and conceals from both the doctor and his patients the truth which is essential to progress.

In the past, writers on this subject have been somewhat apologetic for suggesting that the doctor should investigate so-called sterility after only one year of involuntary sterility (Meaker, 1934), or after 4 years as advocated by Matthews Duncan (1866). We encourage routine dental and medical examination as a means of keeping people fit, and this encouragement is likely to grow with the progressively broadening concept of the sphere of preventive and social medicine. It seems unreasonable, therefore, not to encourage newly-marriedcouples who are desirous of producing infants to seek advice and to seek it early if delay in conception is causing them anxiety. In fact the conventional attitude to this subject is so changing that on occasions to-day a couple will ask for an opinion on their fertility before mar-

<sup>\*</sup>The Biennial Scholarship (Sterility) Lecture given at the College House of the Royal College of Obstetricians and Gynaecologists on 4th July, 1947 (abridged).

riage. Many who seek help will, in the early stages at any rate, require only reassurance and advice, but this advice if given in time may save many a marriage from disaster. The fact remains that even to-day many men and women enter marriage with little understanding of its physical implications and responsibilities, and the case-records of those handling large numbers of patients complaining of sterility reveal that this ignorance is not confined to any one class of patients. It is found among artisans, teachers, the clergy, and even in the medical profession itself. To refer to but one manifestation of this, Green-Armytage in a series of 307 private patients complaining of primary sterility found that the hymen was intact in 4 per In 5 per cent of one series of 581 private and hospital patients with primary sterility, seen by me, the marriage had never been consummated and many of these patients were unaware that anything was amiss with the physical side of their married life. These somewhat startling figures give ample proof of the need for better pre-marital guidance on sexual matters and the need for readily available advice when this is necessary during mar-It would be difficult to assess the loss of potential citizens to the nation from this ignorance which from a social point of view is culpable. To give advice on these matters is even more time-consuming and much less dramatic than performing plastic operations of varying degrees of ingenuity on already disorganized Fallopian tubes, but because of the great need for the one and the poor results from the other we should try and keep a sense of proportion and realize where there is the greater need.

We should remember that unfortunately it is not every woman who desires to conceive who should be encouraged to do so. Active tuberculosis, severe heart disease,

chronic nephritis, severe hypertension, do not suppress the maternal instinct, and in such cases to assist conception with its grave dangers to the mother, dangers so grave that the pregnancy may later require termination, is to submit the distressed woman to a fate worse than that of Tantalus. This is an aspect of fertility-investigation which has been overlooked too often by both the practitioner and the specialist. It follows, therefore, that every patient should have her general health carefully assessed with due reference to her personal and family history, and particular reference to those conditions which would give rise to major hazards during pregnancy, before efforts are made to help her to conceive.

It is fantastic that to-day there are still all too many physicians who ignore the male in their study of fertility. Perhaps even more fantastic are the extremes to which others are prepared to go. On the results of one semen-investigation they are prepared to give a prognosis. They will foretell complete sterility, varying degrees of subfertility, the risks of repeated abortion, the probability of malformed infants, or the necessity for artificial insemination. The march of events frequently exposes their ill-informed prognosis as fantasy, but none the less, at the present time the importance of the male is still too often either ignored or over-emphasized.

It is interesting at this stage to note that in our own series the incidence of defective male secretion and defective ovulation in the female are 35 per cent and 28 per cent respectively. In both cases we know that the defect is fortunately frequently merely a passing phase and that in the female prolonged suppression of ovulation is not a common cause of sterility. Perhaps some future lecturer will tell us the results of a more detailed study of these facts and show that there are responsible factors which

may be correlated in the male and female. Time does not permit of more reference to this aspect to-day.

The first great contribution to the subject of infertility was made in America (1920), with his perfected by Rubin insufflation test. Barriers preventing the union of ovum and sperm can exist at any level of the female genital tract, but it is to the subject of tubal occlusion that most attention has in the past been devoted. With the development of his test Rubin provided an apparently simple means of determining if Fallopian tubes were patent and it is natural that great attention should have been focused on this method of in-One must pay tribute to vestigation. Rubin for the care with which he drew attention to the difficulties and dangers which could arise with this simple procedure.

When it was found that following insufflation many patients conceived with little delay the test was credited with therapeutic as well as diagnostic virtue. That it is still the only test used by many who feel competent to investigate infertility is a tragic fact. That it should be so is fan-Now, from the patient's point of view probably the most important aspect of the interpretation of the test is in those cases in which gas fails to pass through the tubes. The obvious conclusion is that the Fallopian tubes are blocked and countless numbers of women the world over have been told that pregnancy was impossible only to find to their surprise and delight that it did in fact occur. Nor was this prognosis always given by inexperienced physicians. Extensive clinical experience has shown that the obvious deduction is frequently not the correct one, and as a result gynaecologists have become progressively more cautious in diagnosing tubal occlusion in this way. It is now generally accepted that the failure of gas

to pass on only one occasion is not sufficient evidence on which to diagnose a blockage. This is an important fact which cannot be emphasized too strongly and will be dealt with in more detail shortly. The question which naturally demands an answer is why gas should fail to pass if the tube is not irrevocably blocked. It has been suggested by numerous workers that possibly the attempts at insufflation were responsible for breaking down filmy adhesions and thus restoring patency, or that a plug of mucus was displaced.

An explanation for the previously accepted high incidence of blocked Fallopian tubes in the apparently healthy woman was advanced by Sharman (1944) when he suggested it may be due to subclinical tuberculous salpingitis. We cannot accept this view in the light of the evidence we have collected, some of which will be presented later. Α further relevant point in refuting the suggestion is that in our series of cases of proven endometrial tuberculosis, with presumed tubal infection, 50 per cent in which insufflation was performed only once before the diagnosis was established had patent tubes. There would not, therefore, appear to be any valid reason for incriminating tuberculosis as a major cause of tubal occlusion although, quite apart from its effect on tubal patency, the importance of the condition of endometrial and tubal tuberculosis should not be forgotten.

Rubin (1932) was himself the first to draw attention to the occurrence of isthmo-tubal spasm, and in his review of 12 years' experience of the insufflation test he reported that in 4.7 per cent of 2,192 patients he had detected spasm. Forty-three per cent had patent Fallopian tubes. In 26 per cent tubes were blocked and in 26 per cent he diagnosed strictures and peritubal adhesions. Now a very interesting point is that there

was little of statistical significance in the incidence of pregnancy in the three groups of normal patency, spasm, and strictures, for the results quoted were 26.82 per cent. 20.38 per cent and 21.58 per cent respec-These similar results naturally raise the question whether from a functional viewpoint the division into the three groups was justified. In other words was the test capable of being misinterpreted, and did tubal stenosis and peritubal adhesions really exist, or was there some other explanation for the observations so interpreted? In Rubin's series the incidence of complete tubal occlusion was 26 per cent. Green-Armytage has personally reported to me an incidence of 29 per cent with a 14 per cent incidence in a series of cases of primary infertility. Sharman\* (1944) reports an incidence of 38 per cent when the insufflation test was used and 37.7 per cent when the investigation was by hysterosalpingography. Siegler (1944) reports a figure of 50 per cent, Goodall (1933) of 35 per cent, and Feiner (1942) of 35 per cent by insufflation and 44 per cent by uterosalpingography. These results lead me to a passing reference to the claims made for the X-ray test. With the wider adoption of the valuable technique of uterosalpingography more and more fantastic claims have been made for it. Arguments have raged as to whether it is more or less accurate than the insufflation test. It has been claimed to reveal unilateral tubal blockage and Sharman (1944) and Young (1944) among others have stated that it shows the precise site of tubal blockage, while some workers claim that it is the only accurate method of measuring the size of the uterus and hence of detecting varying degrees of hypoplasia. This is a particularly interesting example of the subordination of clinical sense and direct methods of measurement to the subtle appeal of the shadow. An illustration later will show how fallacious this can be (Fig. 1).

Now, by whichever method tubal patency has been tested the results to date on any large series have been comparable and the figures for tubal occlusion have been in the neighbourhood of 25 to 35 per cent, with the exception of the recent figures published by Jackson (1947) and reference will be made to these later.

To complete the assembly of relevant facts, in our own series the incidence of apparent blockage is 21.6 per cent. By apparent blockage is meant that no evidence of tubal patency could be obtained either by repeated insufflation tests or by repeated use of insufflation and lipiodol injection. The corrected figure, however, is 12.8 per cent, and an analysis of the last 171 patients in the 1,000 studied revealed that the apparent blockage was again 21 per cent, but the corrected figure was 9 per cent. As a result of our experience at Oxford we now go further and state that we believe that even this figure is too high and that with the improved methods of investigation the incidence of true tubal occlusion will be found to be less than the o to 12 per cent given above.

The fact that Dr. Jackson (1947), working independently at the Exeter Clinic, has now published an occlusion-rate of only 10 per cent supports me in this belief. At this stage, to forestall criticism, perhaps I should say that in our series we have never assumed a Fallopian tube was open. The 9 to 12 per cent incidence of blocked tubes to which I have referred included all those for which we have no proof of patency although we suspect that in some there is only an apparent occlusion where as yet we have been unable to relieve the spasm. Patency was accepted only if insufflation

<sup>\*</sup>Since this lecture was delivered Sharman (1947) has recorded the lower figure of 20 5 per cent.

was definitely successful, a peritoneal spill was established, or pregnancy occurred. As illustrated (Fig. 2) conception occurred on many occasions although we had been unable to establish patency by other means.

Now the fall from the previously accepted figure of 25 to 35 per cent to 9 to 12 per cent demands an explanation and presents problems which are as yet relatively unexplored.

An increasing experience of the surgery of the abdomen and pelvis revealed that congenital tubal occlusion is an extremely rare phenomenon and not likely to be a factor of significance. With the passing years our interest has become more fixed on the question of spasm and uterine irritability, and with an increasing emphasis on the attempts to alleviate this we have reduced the incidence of apparent tubal .blockage to the low level already recorded. A great deal of valuable information has been obtained during the hours spent in the X-ray room screening the uterus and Fallopian tubes, and I would commend to all who conduct these examinations the value of screening your own patients rather than relying on films for your guidance.

Now the first thing we found was that neither atropine nor anaesthesia was a reliable means of abolishing spasm. In fact anaesthesia, or the emotional distress which the thought of anaesthesia so frequently causes, will often precipitate spasm which the anaesthetic fails to relieve. This is an important observation of wide significance. Repeatedly, without anaesthesia, we have established the fact of tubal patency in patients who had been told that their tubes were blocked, after investigation by careful workers using both insufflation and lipiodol injection under anaesthesia. It is of course equally true that on occasion the fear of manipulation without anaesthesia can precipitate spasm, but in both cases as long as this fact is recognized, the

use of effective spasmolytics will lessen the chance of an error occurring.

To relieve spasm, or prevent it, we used reassurance, pethidine, amyl nitrate, and finally that powerful spasmolytic, nitroglycerine in doses of gr. 1/120. Within 4 minutes of the oral administration of a tablet of this, there is usually a profound effect on the spastic uterus. No doubt further study will provide even more effective spasmolytics, but the important point to observe at this stage is that at least 50 per cent of apparent tubal blockage is due to uterine and utero-tubal irritability. Expressed in other words the evidence suggests that there is at the present time an error of at least 100 per cent in estimating tubal blockage by either insufflation or radiological methods unless effective steps are taken to eliminate uterine irritability.

A further point should be noted in passing. If lipiodol or equivalent material flows through the uterus, the Fallopian tube, and into the peritoneal cavity then the tube is patent. That is an obvious fact. lipiodol fails to enter the tube, or entering it, passes a distance, and is then arrested, that need not mean that the tube is blocked. If a subsequent picture, taken say 24 hours after, fails to show a peritoneal spill, this simply means that there is no radiological evidence that the tube is open, but this does not of necessity mean that the tube is blocked. When we remember the physiological pattern of uterine activity as described by Reynolds (1939) and more recently described in the pregnant uterus by Malpas (1944) we realize that there is nothing remarkable in these findings.

If the wave of contraction passes along the tube from the ampulla to the isthmus, and from there spreads through the uterus, it is not surprising that in an active tube there may be an arrest of lipiodol as it passes in the reverse direction towards the ampulla. Nor is it strange that there may be no peritoneal spill. In the same way if the waves of contraction initiated at the isthmo-tubal junction are not perfectly synchronized it is obvious that while one tubal ostium may be patent the other may be closed, and this is the explanation of many, if not most, of the cases of the socalled "unilateral tubal blockage at the isthmus". To investigate this further I studied a consecutive series of III cases in which utero-salpingography had been performed, and the results were interesting. Both Fallopian tubes were apparently blocked in 16, but 3 of these patients had subsequently conceived by the time the study was made, so the corrected maximum occlusion rate was 12 per cent. Both tubes were open in 48, giving an incidence of tubal patency of 43 per cent, but one tube was apparently blocked in the remaining 47. In other words, if we were to interpret these results on their face value without reference to the normal physiology of the uterus, it would follow that there was a unilateral tubal blockage in 42 per cent of the series of III examined. For interest we repeated the examination at a later date on several of the cases selected at random. and found that either both tubes were now patent (Fig. 1), or, as in the case illustrated later (Fig. 3), the opposite tube was now patent, and the original one was apparently blocked. It will be obvious that if the waves of contraction are synchronized then while the regions of the tubal ostia are contracting neither gas nor lipiodol is likely to pass, and the error of diagnosing tubal occlusion can easily be made. Using the radiological technique, screening will reveal the true state of affairs to the experienced eye. This is an important point in these days when many would over-emphasize the value of the shadow and by so doing completely miss the substance.

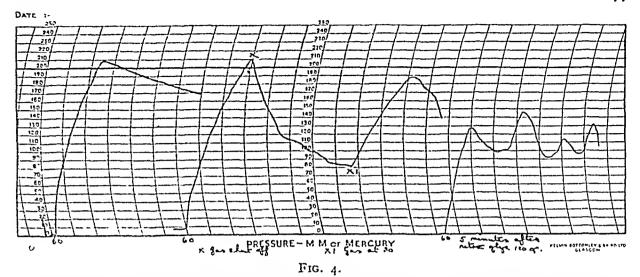
In considering the physiology of uterine

activity there is a further point which deserves mention. Some workers attach great importance to what they call normal tubal peristalsis and go so far as to say that unless this is present conception cannot occur. I have even heard it stated that this aspect of fertility investigation is so important that unless a worker uses a kymograph to detect these oscillations indicating peristalsis the results are useless. Is this not mere fantasy? In the first place it is improbable in my opinion that the oscillations recorded by the kymograph are, in fact, due to tubal peristalsis at all.

But whether they are or whether they are not, they can still be detected by carefully watching the pressure dial of the simpler and less expensive insufflation apparatus.

Moreover, on occasions when gas passes slowly with no sign of tubal peristalsis, and the diagnosis is made of stenosed tubes, the administration of a powerful spasmolytic such as nitroglycerine will be followed by a more normal type of tracing, with oscillations sufficient to satisfy the most peristaltic minded (Fig. 4). On the other hand, when the gas rushes through the uterus and Fallopian tubes at very low pressures; and with again little evidence of so-called tubal activity, the administration of an oxytocic drug such as ergometrine or pitocin will on occasions result in a more normal type of tracing being recorded. Surely all that this means is that the uterus may be either irritable or resting at the time of the examination and the kymographic tracing will vary accordingly.

I submit that the evidence presented has established the fact that previously unsuspected uterine irritability is the most common cause of tubal occlusion, and in the past has been responsible for an error of at least 100 per cent in estimating tubal blockage. That spasm can be induced by



Three attempts at insuffiction show similar results, a slow passage of gas when the pressure is raised to 200 mm. Five minutes after the administration of nitroglycerine, gr. 1/120, the final tracing on the drum was obtained.

instrumentation there is no doubt, but the relevant and important issue to consider is whether uterine irritability may be a more permanent state in certain individuals and may itself be a factor in causing infertility.

I believe this is so, but much of the evidence is still circumstantial and considerable work has to be done before final proof, or refutation, will be available.

The female genital tract is the most "hysterical" portion of a woman's anatomy. It is under both nervous and hormonal control, a fact which is sometimes forgotten in these days of hormonal empha-During the childbearing years it manifests its independent spirit in a multitude of ways: the so-called functional or intrinsic dysmenorrhoea, vaginal spasm and vaginismus, functional bleeding and amenorrhoea, to mention but some of the common manifestations of disharmony. In our search for stronger and better hormones I fear we have somewhat neglected the role of the autonomic nervous system in maintaining the harmony of the genital tract. We have even tended to neglect those hormones such as thyroid which, though possibly less spectacular and

certainly less expensive than many of their newly discovered and widely advertised successors, have proved in the past their great value in the treatment of infertility.

A woman is unhappy and dysmenorrhoea is her periodic misfortune, but with re-established mental peace normal function is restored, and pain disappears. The mother-to-be rejoices in the life she feels within her. The postman arrives with his telegram of news so grim that in the shock of its receipt autonomic disruption occurs, the uterus contracts so violently and so long that the life within is tragically stilled. These are facts known to all. Autonomic disharmony manifest elsewhere is responsible for duodenal spasm, colonic pain, renal spasms, vascular spasms, oesophageal and gastric stenoses, and it should be remembered that in many of these instances the manifestation is not a transient one. Just as the man or woman may waste from inanition in the presence of an abundance of food and the desire to eat, because an autonomic instability reveals itself in a cardiospasm (Fig. 5), even so, is it not probable that a woman may deprive herself of the conception she desires because

of the very strength of the desire, or the fear of it? If this were so it would make easy the explanation of why pregnancy so often occurs after adoption is undertaken by a couple who have remained infertile for many years. It could also explain why conception occurs after years of infertility, when at last a woman decides to ask advice and before any investigation is undertaken. With the mental conflict eased normal function can be restored. Extreme uterine irritability may be but one of the manifestations of this genital tension. Just as fear will inhibit salivation and parch the mouth, so it is possible that anxiety may affect cervical secretion and result in those departures from the normal to which Barton and Wiesner (1946) and Clift (1945) have drawn attention.

Now what of the woman who, having conceived her much desired infant, then aborts and later does the same again? Is there an automatic instability so great that minimal stimuli may provoke an extreme response? If so, with each repeated disappointment the state of tension increases and with it the chance of further disappointment. I believe this often is the case and our radiological study of the uteri of women who, in the absence of any detectable local or constitutional factors to cause abortion, habitually abort, encourages us in the belief that these women have extremely irritable uteri. If further proof of this interesting probability is forthcoming new avenues of treatment for this distressing condition will become apparent. There may be an indication for presacral neurectomy in carefully selected cases.

Believing that when all other factors are satisfactory and extreme irritability is present at every examination this may itself be the factor in inhibiting conception, we have recently, in Oxford, been administering spasmolytics prior to intercourse during the fertile period, and already the results

are encouraging, although the method has been in use for only a few months. Reference to the fertile period leads me to mention one final fantasy, but one which has now become established as a fact. At the commencement of this century Van de Velde (1904) drew attention to changes in temperature which he claimed took place during the menstrual cycle, but the full significance of this observation has been realized comparatively recently. In practice it often works, and the charting of the morning temperature can be a great help to a woman anxious to conceive (Figs. 6 and 7). All who have had experience in these matters know how inaccurate many women can be when they give information on how regular their periods are. A careful study of 168 consecutive cases showed that the monthly cycle varied by a minimum of. 6 days from the so-called normal, 28 days, in 32, i.e. 19 per cent.

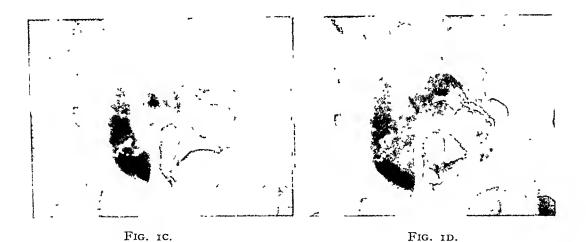
Those who are arithmetically inclined can estimate the possible effect this could have in delaying conception even if all other factors were favourable. This common minor irregularity provides a further argument for using any available accurate guide to ovulation, and this is the great value of the morning-temperature record.

In this mixture of fact and fantasy, it will be apparent from the consideration of those factors which time has permitted us to review, that the subject of fertility-investigation is now a more complicated one than it was 20 years ago, but it is well to remember that the issues of human anxiety and happiness are still the same. If we are to justify the confidence our patients have in us we must be prepared to keep abreast of modern developments, or else be honest enough to admit that we are no longer in a position to undertake the responsibility of their care.



FIG. IA.

Fig. 1B.



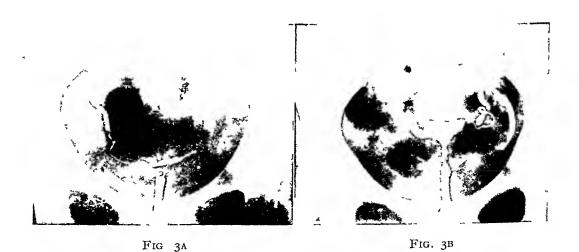
The above films were taken on three separate occasions. The first film was taken without an anaesthetic, the second a month later after the cannula had been introduced under pentothal anaesthesia. The third and fourth were taken one year later at an interval of approximately two minutes, but after the administration 15 minutes previously of nitroglycerine gr. 1/120. A study of these four films shows how easily an error could

nitroglycerine gr. 1/120. A study of these four films shows how easily an error could be made in assessing the size, shape and position of the uterus or the patency of the tubes if only one film were examined. These films indicate the importance of studying the behaviour of the uterus under the fluoroscope in preference to relying on a study of films.



FIG. 2.

Film showing apparent bilateral tubal occlusion in spite of administration of nitroglycerine as a spasmolytic. Previous attempt at insufflation had been unsuccessful at a pressure of 200 mm. Six weeks after the taking of this film the patient was pregnant and was subsequently safely delivered at term.



- (a) Film shows extremely irritable uterus with filling of right tube to ampullary end filling of left tube Subsequent film two hours later showed spill on right side.
- (b) Same patient examined one month later reveals filling on left side with no evidence of filling on right side A film taken six hours later showed spill on both sides.



Fig. 5A.
Reveals cardiospasm.

J.S.



Fig. 5B.

Indicates the effect of nitroglycerine, gr  $_{\rm I}/_{\rm I20}$ , taken half hour before the examination was repeated.

J.S.

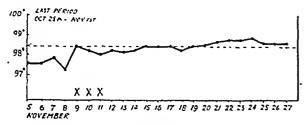
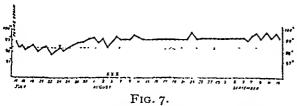


Fig. 6.

Tubal insufflation was unsuccessful with this patient. Salpingography revealed an apparent bilateral tubal occlusion. A repeat examination two months later, after the administration of nitroglycerine, gr. 1/120, revealed an extremely irritable uterus with tubal filling. Following this investigation, pethidine, 50 mg., was given night and morning during the time of ovulation, but six months later conception had not occurred. The technique of basal temperature recording was explained and the chart reproduced was the first one recorded by the patient and reveals the commencement of pregnancy. The pregnancy proceeded uneventfully to term when a healthy infant was delivered.



This illustrates a less typical type of chart, but none the less one indicating conception. Pregnancy progressing uneventfully to term.

In Figs. 6 and 7 xxx marked the days on which intercourse occurred.

#### SUMMARY.

- 1. The need for pre-marital advice on matters of sex, and for marriage guidance is emphasized by the fact that 4 to 5 per cent of a series of married women complaining of infertility were found to be virgins.
- 2. The importance of performing a careful medical examination before investigating infertility is stressed.
- 3. In the author's series of 1,000 consecutive cases of infertility, at the first examination it was found that defective male secretion was present in 35 per cent of the men examined and defective ovulation

in 28 per cent of the women examined. It is noted that defect in either male secretion or ovulation was frequently of temporary duration and that the corrected figures after repeated examinations would be much lower.

- 4. Reference to the results published by other workers show that the incidence of complete tubal occlusion varied from 26 to 50 per cent. In the author's series the incidence of apparent blockage was 21.6 per cent, but by the use of spasmolytics such as nitroglycerine it is shown that the incidence can be reduced to 12.8 per cent, and in a smaller series of 171 patients investigated at the end of the series the apparent rate was 9 per cent. The suggestion is made that even this rate of 9 per cent to 12 per cent is probably too high, and that it includes patients with apparent occlusion due to uterotubal irritability unrelieved even by nitroglycerine.
- 5. On the above figures it is claimed that unless effective steps are taken to relieve hitherto unsuspected uterotubal irritability the results of the infertility test and lipiodol investigation are likely to have at least 100 per cent error.
- 6. A detailed study of III patients in whom the uterus and Fallopian tubes were investigated under the fluoroscope indicated that probably the most common cause of unilateral uterotubal blockage is the lack of synchronization of waves of contraction originating at the uterine cornua.
- 7. From the above findings the importance of uterine irritability in infertility is stressed, and it is suggested that it may also be of importance in the causation of repeated abortions.

I wish to express my gratitude to my colleagues, Miss Lawlor and Mr. Hawksworth, for all their assistance, both in the conduct of the Fertility Clinic and in the preparation of this lecture. I also express

my gratitude to the Radcliffe artist, Miss Arnott; to the Photographic Department of the Radcliffe Infirmary for the slides they have prepared; to Dr. Kemp and the Department of Radiology for their patience and assistance; and to Mr. Ian Sutherland of Professor Ryle's Department of Social Medicine for his guidance on statistical analyses.

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## A Case of Adenomyosis of the Uterus with Tuberculous Infection

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THE combination of tuberculosis and adenomyosis of the uterus is not common. Within recent years cases have been described by Koberle (1939) and by Fagioli (1935), who both give excellent and detailed reviews of the subject in which they include most of the cases so far reported. Johnstone (1924) reported the last case to be mentioned in British journals but, since each of these authors has reviewed a number of the same cases, the total number so far reported is only 25.

Even rarer is tuberculous invasion of fibromyomata, for, in his monograph of 1918, Lockyer quotes only one case (that of Cullen) and suggests that even it might, in fact, have been of adenomyoma. Fagioli, however, reporting a series of 14 cases, describes 6 as being due to tuberculous infection of fibromyomata; but commoner, it would appear, is a co-existent fibroid with a tuberculous infection of an adenomyoma.

The case reported here is that of a wellmarked adenomyosis with a tuberculous infection.

Description of the Case.

Mrs. G., Ayr, aged 38, was admitted as an emergency with uterine haemorrhage to Ballochmyle Hospital, Ayrshire, on 15th February 1947 and was discharged on 27th March 1947. She gave a history of severe uterine haemorrhage of 14 days' duration, and occasional attacks of lower abdominal

pain with no real relation to the haemorrhage. She had been curetted 4 times in various hospitals and in one a microscopic diagnosis had been made of tuberculous endometritis. She had been discharged from another hospital 9 days before the present attack, having been there a month with intermittent bleeding. She was nulliparous with regular periods which lasted 7 days. Apart from the haemorrhages she was well with no cough or genito-urinary symptoms. She was well built and an X-ray of the chest was negative. Her blood pressure on admission to Ballochmyle Hospital was 140/90 with a pulse rate of 120. She had a large mass filling the lower abdomen and extending to the umbilicus. Her haemoglobin was 40 per cent so she was given a blood-transfusion and kept at rest. However, she bled again and was given a further pint of blood; under anaestlesia on 17th February 1947 a diagnostic curettage was carried out and the uterus, which appeared to be a thickwalled sac lined with granulomatous material, was tightly packed with gauze. Microscopy confirmed the previous report of tuberculosis. As it was felt that with removal of the pack haemorrhage would start again, it was decided to take out the uterus. The patient had been given 100,000 units of penicillin 8-hourly from the time of packing and on 19th February, after a blood drip had been set up, she was operated on under curare and gas and oxygen anaesthesia. The cervix was first closed with 2 silk stitches. On trying to open the abdomen no peritoneal cavity could be found. The small intestine, transverse colon, and pelvic colon were densely adherent to the uterine mass. These were dissected off and the body of the uterus, which was adherent to the side walls of the pelvis, the bladder and pouch of Douglas, was shelled out and removed with the cervix. The vagina was loosely sutured and the intestines, which appeared to be densely adherent, were allowed to fall back in the pelvic cavity. The abdomen was closed in layers. The operation lasted 11/2 hours. The patient was moderately shocked, but returned to the ward in good condition. Penicillin was continued for 10 days as she had fever and she was also given a course of sulphathiazole. On 25th February, when the superficial stitches were removed, her abdominal wound opened down to the bowel but there was no evisceration. A secondary suture was carried out immediately under gas and oxygen with silver wire.

These sutures were removed 15 days later and the union was excellent. The patient was then allowed to get up and made an excellent recovery. She had some vaginal discharge which cleared up with douching. She reported back a month later and some granulations in the vaginal vault were cauterized. She was seen again on 22nd October 1947 when she was examined. There was no shortening of the vagina, the abdominal wound had healed well, the pelvis appeared completely clear, and her general condition was excellent. She had some climacteric symptoms.

Description of Specimen.

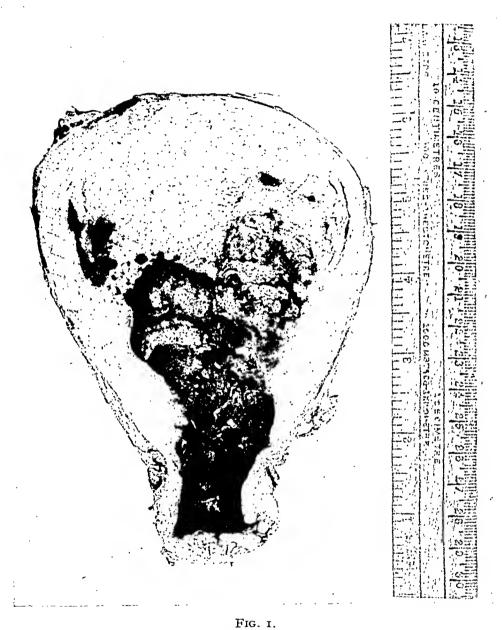
The specimen removed was pear-shaped, 6 inches (15 cm.) long by 4 inches (10 cm.) broad by 4 inches (10 cm.) in depth at its thickest part. The outer surface was sliaggy where it had been dissected away from the surrounding tissue. The ovaries and tubes could not be distinguished. There was a small elevation on the posterior surface on the right side which proved microscopically to be ovarian tissue. The specimen was cut in coronal section. This revealed a cavity with rigid walls and a noncapsulated tumour occupying most of the fundus of the uterus, the cavity being filled with blood clot and necrotic material. The tumour was homogeneous with a honeycombed and pitted surface with interlacing bundles of light fibrous tissue containing darker areas (Fig. 1). Sections were taken through the uterine wall and the tumour. These showed the tumour to be of typical adenomyomatous structure (Fig. 2). In some areas grouped around the glandular elements were numerous giant-celled masses typical of a tuberculous infection (Figs. 3 and 4). It was obviously a very heavy infection. The uterine muscle, however, did not appear to have been affected.

Tuberculous endometritis is not so uncommon as was previously held, and Sharman (1943) in an investigation of cases of sterility found 5.4 per cent of 840, on which an endometrial biopsy had been performed, were positive for tuberculosis. Similarly adenomyosis uteri is being discovered more and more as routine microscopic examination is carried out on specimens obtained at operation. In a review of 1,856 hysterectomies (Hunter, Smith and

Reiner, 1947) an incidence of 27.8 per cent was found. The term adenomyosis uteri or adenomyoma is used as a separate entity because it is descriptive and short. There is no doubt that it is similar in its nature and probably is of the same origin as extrauterine endometriosis, as Goodall (1944) in his long monograph points out; but the term endometriosis interna does not conjure up the same picture as the term adenomyosis, a combination of uterine glands in a fibro-muscular stroma without a definite capsule. Fibromyomata are even commoner, and 20-25 per cent of all women who reach adult age are stated to have these tumours (Eden These 3 conditions Lockyer, 1935). occur separately in large numbers, but the combination of tuberculosis with adenomyosis or fibromyoma is rare. In all the articles written on this subject the question which has fascinated authors has been the riddle of whether the tuberculous condition initiated formation of the adenomyosis or whether the latter has been a focus of weakened resistance. Uterine fibroids in their very character would appear to be resistant to tuberculous infection, surrounded as they are by a well marked capsule. Fagioli (1935) puts forth a theory that muscular tissue is rarely infected by tuberculosis because of the perpetually changing pH (of muscular tissue), which is antagonistic to the growth of Koch's bacillus, and the complete lack of glandular and epithelial elements which appear so necessary for the primary attack by the bacillus. On the other hand, the condition of adenomyosis is much more likely to be vulnerable, particularly if it is, as Novak (1947) states, "a benign invasion of the endometrium in the uterine musculature associated with a diffuse overgrowth of the latter". If the infection has spread from the uterine mucosa into the wall of the Fallopian tubes, as it would appear to do in

the majority of cases, the spread along the glandular elements can hardly be doubted. The resemblance between chronic tuberculous infection of the Fallopian tubes and adenomyosis has led Continental authors to suppose that the irritating effect of the toxin of tuberculosis has started an epithelial reaction in the form of adenomyosis. It is difficult to support this hypothesis when the number of cases reported at the present time of tuberculous endometritis without adenomyosis is considered. It would appear that the relation is purely casual, the adenomyosis originally being present and being just another area of hyperplastic glandular epithelium offering a fertile field for the attack by the tubercle bacillus.

From a study of the cases the possibility of exact diagnosis beforehand is small. The condition comes to operation either as a fibroid tumour of the uterus or a tuberculous condition of the endometrium. The commonest symptom is menorrhagia (in this case it was severe bleeding) generally associated with a pelvic tumour. Poppi's (1936) case, however, which must be unique, never menstruated at all, though preserving all the secondary sex characteristics. Unless a diagnostic curettage is done and tuberculous endometritis found, the latter will never be suspected. Curettage as a diagnostic aid in cases of suspected tuberculosis is condemned by Curtis (1946) as a needless risk, but Sharman (1943) has done repeated curettage on cases of tuberculous endometritis without danger to life or evidence of the spread of the disease. Other symptoms are those generally related to pelvic masses or tuberculosis affecting other organs, though a surprisingly large number present no evidence of active tuberculosis. Among all the patients where the information is available the only one who had been pregnant was Köberle's (1939). She had had 2 pregnancies and 2 abortions. Adenomyosis in itself is by no means a bar



Posterior half of specimen cut in coronal section showing adenomyoma, fundus of the uterus, necrotic material and blood clot in uterine cavity.



Fig. 2. Low-power view of adenomyoma.

R.DE S.



Fig. 3.
Uterine wall, adenomyoma and numerous tuberculous gaint cells. ×45



Fig. 4.
Showing giant cells and endometrial type of glands. × 100

to pregnancy. In a large percentage of cases operated on for this condition there has been a previous pregnancy. On the other hand, tuberculosis of the genital organs is almost always associated with sterility. This would suggest that in Köberle's case, where there had been previous pregnancies, the tuberculosis was secondary to the adenomyosis.

In the case quoted, as the patient had to be packed to control severe uterine haemor-rhage, a biopsy was done at the same time. This patient had had 4 previous curettages without ill-effect, although there may have been some secondary infection introduced which had given rise to the close adherence of the uterus and the neighbouring structures. However, I think this is unlikely as the complete absence of a peritoneal cavity suggests a previous plastic tuber-culous peritonitis.

With regard to the treatment of these cases every one was subjected to radical surgery. The bogy in surgery of tuberculosis of the female genital organs has been fistula-formation afterwards. Poppi's case the abdominal fistula took a year to heal. The rest, however, healed by first intention. In my own case the wound opened up to the abdominal cavity on the 8th day. Secondary suture was completely satisfactory and the wound healed well without fistula-formation. Fistula-formation is almost always due to secondary infection and to-day we have penicillin and sulphonamides to combat this. Most cases were subjected to subtotal hysterectomy with removal of the adnexae, though I think that if it can be accomplished easily total hysterectomy is preferable. Other forms of treatment advocated for tuberculosis of the genital organs are deep X-ray therapy, sunlight treatment, and more recently intraperitoneal instillation of oxygen, but the type of case under consideration is peculiar

in that there is an associated tumour with the tuberculosis and in some cases a plastic peritonitis which would contra-indicate conservative measures. This is particularly so when there is associated severe bleeding, and though one or two patients have had abdominal fistulae afterwards they have all ultimately healed and the actual operative risk is slight. However, one's responsibility does not end with the temporary success of the operation, as in some of the cases quoted there has been a reappearance of the tuberculous infection in other parts of the body, such as the spine or the urinary tract (Lash, 1934), and unless the patient is followed-up carefully this may be missed and treatment delayed.

#### CONCLUSION.

A case of adenomyosis uteri with tuberculous infection has been discussed, and a plea is made for radical operative treatment in tuberculosis of the uterus and adnexae.

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### Heart Disease in Pregnancy\*

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HEART disease is one of the most serious complications of pregnancy, and both its medical and obstetrical treatment have inspired a rich literature. Its incidence shows it to be a common complication, causing not only danger to life, but in many cases, irreparable damage to health.

Jensen et al. (1940) state that about 1.27 per cent of all obstetric patients have clinical evidence of heart disease; Stander (1942) found it present in 2 to 3 per cent; Fitzgerald (1935) 0.66 per cent; and in this country Sheehan and Sutherland (1940) found the incidence in their series to be 1.5 per cent; and Gibberd (1947) 1.6 per cent. Out of 29,713 patients who attended Queen Charlotte's Maternity Hospital during the years 1937 to 1946 inclusive, the total number with heart disease was 225, an incidence of 0.8 per cent.

The mortality rate, too, is high, and occupies a prominent place amongst the causes of maternal death. Jensen (1938), reviewing the literature, found the death rate in obstetric patients with heart disease to be 4.3 per cent; in Sheehan and Sutherland's series (1940) it was 3.8 per cent; in Gibberd's (1947) 1.7 per cent, and in the present series 3.1 per cent. Jensen (1938) states that the general over-all figures are, however, a great improvement on previous ones, having fallen in recent years from

Further, the part played in maternal mortality by heart disease has assumed larger proportions owing to the spectacular lessening of deaths from other causes, so that Eastman (1937) believes that only sepsis and toxaemia claim more lives during pregnancy and the puerperium; and Jensen et al. (1940) say that heart diseasc comes 4th or 5th among the causes of mortality, and is possibly the most important during labour and the puerperium. Stander (1942) found in his series of patients that heart disease was responsible for 10.4 per cent of all maternal deaths, and Munro Kerr and MacLennan (1932) found that it caused 7.7 per cent of maternal deaths, whilst in the present series it formed II.5 per cent of maternal deaths from all causes during the 10 years reviewed.

about 8-10 per cent to 2-3 per cent, and he attributes this improvement to a greater appreciation of the danger, and better understanding of cardiac problems in pregnancy, and to the extension of antenatal care. As regards the importance of the latter, Lamb (1934) found the death-rate to be 2.2 per cent among those of his patients with heart disease who had antenatal care, whereas it was 20 per cent in those who did not attend an antenatal clinic; and Crighton Bramwell's figures (1935) showed a deathrate of almost 70 per cent in obstetric patients with heart disease admitted as emergencies, as compared with one less than 3 per cent amongst those who had antenatal care.

<sup>\*</sup> The William Blair Bell Memorial Lecture delivered at the Royal College of Obstetricians and Gynaecologists, 14th November, 1947.

Causes of Maternal Mortality
1st September, 1932, to 31st December, 1941
(Stander, 1942)

67 deaths in 34,353 patients

	Number of cases	
Infection (antepartum, postpar-		
tum, postabortal)	13	19.4
Pulmonary complications	10	14.8
Postpartum haemorrhage	9	13.4
Cardiac disease	7	10.4
Pneumonia	. 6	8.9
Toxaemia of pregnancy	4	6.0
Premature separation of placenta	. 3	4.5
Cerebrovascular accident	3	4.5
Pyelonephritis	2	3.0
Circulatory collapse	. 2	3.0
Post-operative haemourhage	I	1.5
Tuberculosis, miliary	. I	1.5
Placenta praevia antepartun	l	
haemorrhage	. I	1.5
Chorionepithelioma	. I	1.5
Blood dyscrasia, erythroblastic		
splenomegaly	. 1	1.5
Psychosis, re-active panic		
(suicide)	. I	1.5
Peritonitis, after appendiciti	s I	1.5
Not determined, insufficient		
data	. I	1.5
Total	67	99.9

Total maternal mortality, 1.98 per 1,000 pregnancies

Causes of Maternal Mortality for the period 1937–1946
(Queen Charlotte's Maternity Hospital)

Queen Charlotte's Materinty Hospital)
59 deaths in 29,713 patients

					Number of deaths	
Obstetrical co	mpl	ication	s, inc	lud-		
ing haemor					15	25.4
Toxaemia of	preg	nancy			13	22.0
Sepsis		• • •			II	18.6
Heart disease	Э	•••			7	11.6
Embolism	• • • •	• • • •			4	6.8
Acute pulmo	nary	infect	ions		2	3.4
Abortions	• • •	•••	•••		1	1.7
Other causes		•••	•••		6	10.2
Total	•••	•••	•••	•••	59	99.7

Total maternal mortality, 1.95 per 1,000 pregnancies.

The other causes were: epilepsy, carcinomatosis following mammary cancer, intestinal obstruction, uraemia, appendicitis, uncertain. Of the 15 deaths from obstetric complications, 7 were due to placenta praevia and postpartum haemorrhage.

Causes of Maternal Mortality (excluding abortions) in England and Wales for the Year Ending 31st March, 1946.

	Number of deaths	
Obstetric complications includ-	•	
ing haemorrĥage		25.9
Toxaemia of pregnancy		23.6
Sepsis	. 110	15.9
Heart disease	. 59	8.6
Pulmonary infections (including	{	
tuberculosis)	• 54	7.8
Embolism	·	5.8
Other conditions	. 85	12.3
Total	690	99.9

#### THE ASSESSMENT

The patient's ability to go through pregnancy and labour with the minimum risk to life and health must be assessed with the greatest care. Pregnancy increases the work of the heart and the gravid uterus places an abnormal strain, possibly one of serious moment, on the damaged heart. There are certain changes also in the heart and circulation in pregnancy, such as the increase in volume of circulating blood, the greater vascularity of the enlarging uterus and the increase in body-weight; while the splinting of the diaphragm during the later months, with rotation and displacement of the heart. may also cause breathlessness and palpitations, even in a healthy patient. Jensen (1943) states that the metabolic-rate is increased often out of proportion to the increase in weight, and the heart meets the extra demands made upon it by increasing its minute-volume; and, he adds, it is not definitely decided if this is accompanied by

an increase in the rate or the stroke-volume of the heart, and there is a further possibility that not all hearts react in the same way. Whether true hypertrophy of the heart occurs is still a disputed point; it is not, in all events, grossly apparent and experimental studies have failed to show it. Stander and Cadden (1932) have shown that in normal gestation in animals and humans, the cardiac output rises above the normal level in the 4th month and steadily increases until, at term, it amounts to approximately 50 per cent above normal. Cohen and Thomson (1939) found an increase in the cardiac output up to the 9th lunar month, with subsequent decrease prior to labour at term. It is conceivable, therefore, that under the changing conditions of pregnancy slight overtaxing of a damaged heart may produce irreversible change and precipitate failure.

Again, since the maternal mortality in heart failure is so much greater than in patients with a fully compensated heart, it is necessary to determine the degree of cardiac reserve in each individual, to anticipate, and if possible prevent, the development of heart failure. This estimation, as Mackenzie (1921) first showed, can be made from the patient's response to the routine of daily life and, although this is not an infallible guide, it has shown itself to be so much better than any other single means of measuring the heart's response to effort and the degree of cardiac reserve present. On this principle the New York Heart Association based their classification of patients with cardiac disease into 4 groups. As Lamb (1937) and Pardee (1937) say, in most American clinics to-day, the functional classification for patients with cardiac disease, accepted by the American Heart Association, is used as an index of whether such women will be able to withstand the strain of pregnancy and labour. Cases are, therefore, grouped according to the ability

of the heart to withstand effort, rather than according to the structural damage and other factors. The grouping is as follows:

Group I. Patients with no limitations to normal active life or symptoms of heart disease; and in whom the only sign is the heart lesion itself.

Group II. Patients with slight limitation of the amount of work that can be done without breathlessness. Such patients are breathless at the end of effort, e.g., climbing flights of stairs, they have to rest at the top; or they have to rest at the end of some routine housework.

Group III. Patients with definite limitation of the amount of work that can be done without breathlessness. They have to rest two or three times whilst climbing a flight of stairs, or at intervals in their housework, and they stop to rest on their way home from shopping.

Group IV. Complete limitation of the amount of work which can be done, so that there is heart failure at rest.

This classification has been used in this country by Gilchrist (1931), McIlroy and Rendel (1931), MacLennan (1933), and others, and it has been shown to be a satisfactory guide, in the large majority of cases, to the patient's response to the effort of labour, and forms a valuable means of determining the help which may be necessary to effect delivery. It is true, however, that the heart lesion itself being a progressive one and the patient's own response to the pregnant state a varied factor, the patient may start pregnancy in one group and deteriorate to another. This is, however, an accident which is largely avoidable by careful antenatal supervision, examinations at frequent intervals.

Lamb (1937) takes additional factors into consideration to augment the American Heart Association classification and these are:

I. The structural changes in the heart

itself, as judged by the size of the heart and the extent of the valvular damage.

- 2. The duration of the disease.
- 3. The presence of signs indicating activity of the rheumatic process.

4. The presence of auricular fibrillation. Lamb (1937) emphasizes the importance of a long, rumbling, diastolic murmur, existing throughout diastole, as indicative of a high degree of structural damage of the mitral valve and definitely increasing the risk of failure, and states that 62 per cent of these women decompensated. Harris (1937) states, however, that no difference in prognosis can de deduced from the type of lesion, whether mitral stenosis alone, or aortic regurgitation, or both together; and in Hunt's series of 156 cases, reported by Maurice Campbell (1926), aortic lesions were found to be no more unfavourable than mitral. The help gained also from the cardio-thoracic diameter is equivocal since there is a displacement of the heart, which makes interpretation of the sign of doubtful value and, as Gilchrist (1931) warns, a small heart may fail and a large one stand the strain of repeated pregnancies. Generally speaking, Lamb (1937) states, the longer the duration of the disease, the greater the possibility of failure developing during pregnancy, and in the series he reports decompensation occurred in 4 of the 7 cases seen with active rheumatic disease.

Auricular fibrillation is recognized by all authors to be a serious complication, and Lamb (1937) states that decompensation occurred in 75 per cent of those patients with it. In the series reported here, there were 7 patients who had or who developed auricular fibrillation; 3 died, and the condition of the remaining 4 was described as only fair on their discharge. Gilchrist (1931) also stresses the importance of a previous history of heart failure which, although followed, as it usually is, by recovery from the first attacks, may cause such damage to

the heart that it leaves a diminished field of effort, and the patient is more readily prone to further attacks. Jensen (1938), too, states that a patient may pass through many pregnancies without the heart becoming decompensated, but, if this condition occurs in any one pregnancy, she very rarely passes through a subsequent one without the heart becoming decompensated again. Termination of the pregnancy in those patients should be carefully considered.

Should the decompensation be caused by an acute cold or transitory strain, however, the outlook is better, since compensation is usually readily regained when the cause is removed.

Therefore, in assessing the patient's ability to go through the strain of pregnancy, full care is given to the avoidance of decompensation which is attended by a high mortality rate—in this series 10.7 per cent in Groups III and IV as compared with 0.6 per cent in Groups I and II. Patients in the early months of pregnancy in Group III who fail to respond to medical treatment, Group IV patients who are already in heart failure and patients with auricular fibrillation should therefore be advised to have the pregnancy terminated.

#### THE MANAGEMENT

Medical Treatment.

The medical treatment during pregnancy consists, briefly, of:

- I. The maximum rest possible for every patient—at least 2 hours in the afternoon and I2 hours nightly.
- 2. Examinations carried out at weekly intervals throughout the whole of the pregnancy.
- 3. Instruction given to the patient to avoid chills and upper respiratory tract infection and to treat them seriously should they occur. An illness which at other times may be trivial may well be the signal of a

break in compensation and precipitate has been taken of the Home Help Scheme heart failure.

and assistance is provided for those for

4. Admission to hospital of all heart cases for one week—preferably about the 28th week of pregnancy—for observation and assessment; and again one week before delivery for complete rest and reassurance.

Hamilton (1947) lays stress on the frequent examination of the patient, particularly watching for the appearance of crepitations at the lung bases which, as Mackenzie (1921) stressed, heralds the onset of heart failure. Stander (1942) emphasizes what he calls stubborn medical care, insisting that the patient keeps to a strict daily routine worked out with her, and that she should immediately report any new development such as breathlessness or an upper respiratory tract infection: he also stresses the seriousness of both anaemia and upper respiratory tract infection, regarding the latter as especially ominous and stating that it may be the first signal of a break in compensation of the heart. Jones (1944), too, states that bronchitis and influenza are often the precipitating causes of heart failure in pregnancy: and since, he adds, in his series 20 per cent of the patients developed upper respiratory tract infections, it is wise to warn the patient of this and confine her to bed until she is better. Fitzgerald (1935) admits to hospital patients who are unable to do light household work without breathlessness, if they have a persistent cough, or if their pulse is over 100, or if they need an extra pillow to sleep at light. Hamilton and Carr (1933) advocated an even more restricted regime than usual for patients of 35 years or older, stating that, although age alone does not forbid pregnancy to a patient with heart disease, these patients are twice as likely to fail under the same conditions as those less than 35 years of age.

At Queen Charlotte's Hospital advantage

has been taken of the Home Help Scheme and assistance is provided for those for whom the heavy routine of housework, the queueing and the shopping, is proving too great a strain.

#### Obstetric Treatment

According to the American Heart Association classification, the care during labour can be planned, and the type of labour anticipated.

Group I. Normal delivery at term can be expected.

Group II. Normal delivery at term, aided by forceps, if there is delay in the second stage.

Group III. Forceps delivery early in the second stage, unless advance is rapid and delivery quick. The large majority of patients in this group, however, with careful medical treatment during their pregnancy, can be brought into Group II and so treated. It is common to find that many of the patients in this group have been doing too much work, and complete rest in bed produces marked improvement; but should there be a failure to respond to treatment in early pregnancy, therapeutic abortion is advised.

Group IV. No obstetrical treatment of any kind should be attempted until the patient is thoroughly rested and the heart fully digitalized. The patient in such an extremity stands interference badly. After rest and improvement, however, termination of an early pregnancy is undertaken. If seen in the latter part of pregnancy complete rest in bed should continue to term and a vaginal delivery, aided, if necessary, by forceps, is considered the safest method of delivering the patient. There is a tendency amongst patients in this group to go into premature labour before medical treatment has had a chance. In such a situation the patient is a bad surgical risk, and it is safer to allow her to continue with

a well-sedated first stage of labour and to deliver her, if necessary, with forceps, than to submit her to an abdominal operation.

There seems to be a definite course of labour, peculiar to the patient with heart disease, which allows the great majority to have a spontaneous and easy delivery. MacLennan (1933) states that labour in the cardiac patient is frequently short and precipitate and, in his series of cases, the average duration of labour in primiparae was slightly less than 8 hours; in multiparae, 6 hours. Mendelson (1944) states, however, that his data do not support the view that cardiac patients have short labours. In the present series the average length of labour in primigravidae was: first stage 17 hours, second stage 1 hour 7 minutes; in the multiparae the average length of labour was: first stage 6 hours 57 minutes, second stage 24 minutes. While the first stage of labour was therefore of average length in this series, the second stage was short but, equally important, it was typically accomplished with ease. The average weight of the baby in the series was 7 pounds 7 ounces, which, considering the proportion born prematurely, is well up to the normal size.

In the patient with heart disease there is, then, an easy effacement and dilatation of the cervix, followed by a quick descent of the head, without undue straining. softness and succulence of the cervix, and ready resilience of the pelvic tissues may be due to an increased local congestion and may, too, explain why the labour of the Group III and IV patient is often accomplished with surprising suddenness and absence of strain, obviating the necessity of forceps delivery. With the quick descent of the head there is no need for high forceps, which might produce a state of severe shock. One of the great dangers to the patient with cardiac disease is when labour is prolonged, or when shock accompanies any interference. There was a fatal termination in 2 such complicated cases in the present series, one after manual dilatation of the cervix for foetal and maternal distress, in a patient already 126 hours in labour and the other immediately following manual removal of the placenta. Obvious dystocia, such as that associated with disproportion between the foetal head and the pelvis, or a large child presenting by the breech, precludes a vaginal delivery; and there can be no place for trial of labour in patients with heart disease.

Anxiety or fear as a cause of uterine inertia can be met by rest and assurance during the week's stay in hospital prior to delivery, by a simple explanation of the process of labour and by the early use of morphia. Morphia is the drug par excellence for the patient with heart disease, since it gives her relief from worry and eases the pains of labour, both of which, rather than effort or straining, cause an increase in pulse-rate and breathlessness. Mendelson and Pardee (1942), appreciating these dangers, advise immediate digitalization of the heart should the pulse-rate rise above 110 or the respirations above 24 per minute during the first stage of labour: and, they state, such rise in pulse and respiratory rates preceded each instance of cardiac failure which occurred in their patients in the puerperium; whilst no case of heart failure occurred in their patients with pulse and respiration rates below these levels during the first stage of labour, regardless of the severity of the cardiac condition. Avoidance of delay, therefore, is a major tenet in the treatment; and since artificial rupture of the membranes is so frequently associated with prolonged labour, the patient tending to worry about the delay, and her pulse-rate increasing, it is a mode of treatment to be advised only after careful consideration. Neither should there be any place for the recommendation

that pregnancy be terminated in this way so as to have a smaller baby and an easy labour.

The anaesthesia which is well suited for the second stage of labour is a pudendal block with ½ per cent novocaine and, usually, a local infiltration of the perineum, done at the beginning of the second stage. Should low forceps be required, no further anaesthesia will, as a rule, be found necessary, but occasionally, as in the present series, gas and oxygen have been used to supplement the local anaesthesia, although in most American clinics light ether is preferred.

The third stage of labour has a small, but definite, risk for the patient with cardiac disease. The more or less sudden decrease in the intra-abdominal pressure, together with the lowering of the diaphragm and the abrupt change in the cardiac axis, and the closure of the utero-placental circulation can be factors which may lead to cardiac failure, requiring treatment by venesection, cardiac stimulants and oxygen.

## THE POSITION OF CAESAREAN SECTION IN RHEUMATIC HEART DISEASE.

The role of Caesarean section for the patient with heart disease is a limited one. There was a time when the operation was performed more frequently and with results which greatly lowered the then existing maternal mortality from heart This, states Jensen (1938), was due to the previous results being so bad, owing, in turn, to premature induction and interference, which was then the treatment under the belief that the patient had to be rid of the pregnancy as soon as possible. In America, Caesarean section in the presence of heart disease is yearly becoming rarer and Greenhill (1946) considers that the operation is not justified where the sole indication is rheumatic heart disease.

In Fitzgerald's series (1935) of 126 women, with severely damaged hearts, no patient was delivered by Caesarean section because of the heart condition. No maternal death occurred in his series during pregnancy or labour, but there was I death 6 weeks postpartum from acute bacterial endocarditis.

Mendelson and Pardee (1924) reported a series of 200 cases of pregnancy complicated by rheumatic heart disease, in which only I patient was delivered by Caesarean section and the remainder vaginally, without a death in the entire series. In another series of 162 Group III and IV cases, Mendelson (1944) reports a mortality of 12 per cent, following abdominal delivery compared with none at all following vaginal delivery, and all the abdominal operations were elective Caesarean sections without haemorrhage, while at the same time, he states, there was nothing in the histories of the abdominal group to make them appear as the most serious cases, yet there was no doubt about the severity of the vaginal group, which included 34 Group IV cases and 7 with auricular fibrillation. Nevertheless, while the data show that Caesarean section is performed less frequently in Group III and IV patients, there is no justification (Mendelson concludes) for the statement that Caesarean section should never be performed in the presence of heart disease.

MacLennan (1933) says, too, that the results of Caesarean section compare unfavourably with those of forceps delivery; and in his Group III patients there were 22 spontaneous deliveries with 2 deaths, and 16 Caesarean sections with 2 deaths. He adds that in commencing cardiac failure, the shock of a surgical operation, combined with a sudden emptying of a large abdominal viscus, is considerable, so that the justification for the operation is open to question.

Caesarean sections were performed on 21 patients with rheumatic heart disease in the present series, in the following groups: I in Group I; 6 in Group II; 10 in Group III and 4 in Group IV. One death occurred, in a Group III patient, giving a mortality rate of 4.8 per cent. In 4 of the above 21 patients, other complicating factors causing dystocia were present. There were no stillbirths in this series of Caesarean sections, but the neonatal death-rate was 4.8 per cent.

In elective Caesarean sections performed for disproportion on 186 patients with normal hearts over the same period of 10 years at Queen Charlotte's Hospital, the maternal death-rate was 1.2 per cent, the stillbirth-rate 0.6 per cent, and the neonatal death-rate, 3.8 per cent. It is necessary, therefore, that the risk of Caesarean section per se should be borne in mind when advising this procedure.

There is, nevertheless, a very definite place, I consider, for Caesarean section in the patient with heart disease. Where there is the possibility of prolonged or difficult labour, Caesarean section, with its known amount of strain, is to be preferred. There is, also, the type of patient, who late in pregnancy has reached an optimal pitch of improvement, or in whom improvement cannot be maintained and termination of the pregnancy is advisable. Such an indication should be rare, however, since, as Mendelson (1944) states, there are few patients, having reached the latter part of pregnancy, whose condition cannot be maintained until they reach term. Toxaemia of pregnancy may form an indication for termination of the pregnancy and either rupture of the membranes or a Caesarean section must be performed. In the multigravid patient with the cervix soft and already partially dilated and perhaps the head well down, rupture of the membranes, performed without an anaesthetic, can be

succeeded by a quick and easy labour. In other instances, where, for example, the cervix is long and closed, this procedure can be a serious risk, associated as it often is with prolonged labour, the patient anxious and distressed at the delay and her pulserate increasing: and there is the possibility of adding to the risk of sepsis and shock by some form of interference, which is so dangerous to the patient with a damaged heart. Crighton Bramwell (1935) reports that induction of labour, performed in 27 of his patients, had a mortality-rate of 14.8 per cent, whilst in the same series there were 12 Caesarean sections, with a mortality-rate of 8.3 per cent. Both forms of treatment are. therefore, grave undertakings, with Caesarean section the lesser risk to the patient in most circumstances.

The need for sterilization is not regarded as an indication for Caesarean section, but it can be performed, if indicated, at the end of this operation; it is best, however, to wait until a more favourable time to carry out this procedure. Nowadays, with the accurate estimation available of ovulation time, more dependence can be placed on contraceptive methods, which, therefore, may also obviate the necessity for sterilization at a later date.

#### Type of Heart Lesion.

The present series of cases consists of 225 patients, with the following heart lesions:

Mitral stenosis, with or	witho	ut mi	itral	
		•••		174
Mitral stenosis, mitral	incor	npete:	nce,	- •
aortic incompetence	•••	• • •		23
Aortic incompetence	• • •		•••	2
Myocarditis				3
Auricular fibrillation				2
Paroxysmal tachycardia				3
Auricular flutter				1
Mitral incompetence		•••	•••	1
Congenital lesions		•••	•••	4
	•••	•••	•••	13

#### CONGENITAL HEART DISEASE.

The incidence of congenital heart disease is given by Mendelson and Pardee (1942) to be 1.89 per cent; by Abbott (1936) as 1.2 per cent; Bramwell and Longson (1938) 4 per cent; and McIlroy and Rendel (1931) 3 per cent of all organic heart disease cases.

foramen ovale, inter-ventricular septal defects and patent ductus arteriosis all form a special category by virtue of the possibility of a veno-arterial shunt, although this is a rare accident and may be prevented by avoiding strain during labour and by the early use of forceps during the second stage.

Table of Congenital Heart Disease and Pregnancy in the Present Series.

Age	Gravid	avid Mat Lesion		Group	Labour	Mother	Child	Remarks
29	2	40	Exact nature unknown	2	Spontaneous delivery	A	A	
29	2	40	,,	1	,, ,,	A	Α	
28	2	<b>3</b> 8	,,	I	,,	$\mathbf{A}$	A	
24	I	40	.,	I	,,	A	A	
39	2	42	Patent inter-ventricular septum	ī	**	A	A	
21	I	34	Exact nature unknown	4	Caesarean section	A	A D	Also pulmonary tuberculosis and twins
27	4	40	"	2	Spontaneous breech delivery	Α _	A	
24	I	40	Pulmonary stenosis	2	Forceps	A	A	
24	I	38	Patent inter-ventricular septum	4	Spontaneous delivery	A	A	
33	3	40	Coarctation of the aorta	I	,, ,,	Α	Α	
25	2	38	Patent ductus arteriosus		11 11 -	A	Α	•
25	I	38	Inter-auricular septal defect	1	Caesarean section	A	A	
31	2	40	Inter-auricular septal defect	I	Spontaneous delivery	Α	A	

Maternal deaths—o

Foetal deaths-I

In the present series of 225 cases the condition was found in 13 patients, a percentage of 5.8. If the congenital heart lesions with the "exact nature unknown" were omitted the incidence in this series would be 3.1 per cent.

The most serious of these lesions is congenital coarctation of the aorta and a patient with this lesion is advised against pregnancy. Should she become pregnant, however, Caesarean section is indicated in order to avoid the strain of labour, which may cause a sudden catastrophe such as rupture of the aorta or cerebral haemorrhage. There is less risk to the patients with other types of lesions, but Mendelson and Pardee (1942) state that a widely patent

The recent successful treatment of coarctation of the aorta by operative removal of the stenosis may, however, ultimately change the outlook in this fell disease, so that no longer will the sword of Damocles hang over the heads of these unfortunate women.

### THE RHEUMATIC HEART GROUP.

Of the 212 cases of heart disease in this series which were not of congenital origin 194, or 91.5 per cent, gave a definite history of rheumatic fever: but, since in the remaining 18 cases rheumatic fever could not, with certainty, be excluded as a cause of that heart lesion, the 212 cases have been considered together.

Table of the Group with Rheumatic Heart Disease in the Present Series.

,	Group I	Group II	Group III	Group IV	Totals
Number of patients	86	72	37	17 .	212
Percentage in group	40.6	34.0	17.4	8.0	100.0
Spontaneous delivery		50	16	2	141
Forceps delivery Patients delivered after	II	16	5 .	. 5	37
28th week, total per-					
centage <i>per vaginam</i>	97•7	91.7	67.7	63.6	
Caesarean section		6	IO	4	21
Hysterotomy	r	0	6	5	12
Died undelivered		0	O	ı*	r
Maternal deaths	0	I	3	3	7
Percentage maternal					
deaths	0	1.4	8.1	17.6	
Stillbirths	4	0	I	r	6
Neonatal deaths	Ó	2	r	I	4

<sup>\*</sup> Included in next column figure

Analyzing the figures in the table it will be seen that there are more patients in the less dangerous Groups I and II, and that the majority have a spontaneous delivery.

Percentage with Spontaneous Delivery

Group	Present	Gilchrist	Stander	Maclennan
	series	(1931)	(1942)	(1933)
I	85.9	84.6	74.6	" vast majority"
II	69.4	77.0	59.9	69.5
III	51.6	55.6	31.6	44·5
IV	18.1	9.0	15.7	—

Of the vaginal deliveries which ended in the use of forceps, the rate in each group was:

Group I, 13.1 per cent; Group II, 24.2 per cent; Group III, 23.3 per cent; Group IV, 71.4 per cent.

The Caesarean-section rate has already been discussed. It is higher, I think, than need be, but the rate for the later years of the series has been lower.

There were 12 abdominal hysterotomies, with 1 death in a Group IV patient: the hysterotomy in the Group I case was for a patient with mitral stenosis and aortic regurgitation, who already had 3 healthy children. It can be noted that the mor-

tality-rate (8.3 per cent) of abdominal hysterotomy is lower than the mortality-rate (10.7 per cent) associated with Group III and IV patients who proceeded with the pregnancy.

The stillbirth-rate in the series was 3 per cent, including 4 cases complicated by 1 toxaemia, 1 vasa praevia, 1 accidental haemorrhage, 1 artificial rupture of membranes; the corrected stillbirth-rate was, therefore, 2 out of 199 deliveries, or 1 per cent. The neonatal death-rate was 2 per cent. These figures compare well with the rates for all patients admitted to Queen Charlotte's Hospital over a period of 10 years—which were stillbirths, 2.9 per cent; neonatal deaths, 1.6 per cent.

The higher neonatal death-rate associated with the patient with cardiac disease may, at least in part, have an explanation in the greater frequency of premature labour in these patients.

The average age of the patients in the series was 28.9; 131 were primigravidae, of whom 13, or 9.9 per cent, were in Group IV, and 81 were multiparae, of whom only 4, or 4.9 per cent, were in Group IV. It is of interest to note, therefore, that there were more seriously affected hearts in primigravid patients and this is emphasized

by the fact that all of the 7 patients in this series who died were primigravidae, and in a group of cases reported by Crighton Bramwell (1935) there were 145 primigravidae with 13 deaths (9 per cent), 155 multiparae with only 4 deaths (2.6 per cent). The average age of the patients who showed cardiac decompensation was 29.8 years; and as regards the time of failure developing, 70 per cent failed after the 24th week of pregnancy. These figures suggest that the condition of the heart is a more decisive factor in prognosis than the parity; and that it is in the latter half of pregnancy, as might be expected, that the greatest strain falls on the heart—a fact to be remembered where there is early decompensation and the question of abortion is being considered. The average duration of pregnancy for all patients proceeding beyond the 28th week was 39 weeks, and in the Group IV patients pregnancy lasted on an average 37.7 weeks. In the pregnancies going beyond the 28th week and ending fatally, the average length of the pregnancy was 36.8 weeks, showing that prematurity is associated with cardiac decompensation.

There are several factors of interest and importance in the records of the 7 fatalities of this series. Four of the patients were in functional Group II when first seen; I died in this group—a patient already 126 hours in labour requiring manual dilatation of the cervix and forceps delivery for maternal and foetal distress—whilst the others became worse as pregnancy advanced, 2 changing to Group III and I to Group IV. Changes from Group III to Group III are not uncommon especially about the 28th week of pregnancy, but, as stated, in the large majority of cases a week's real rest in bed restores the patient to her own original group. It is disconcerting to find, however, that some of these Group II patients may become worse and develop cardiac failure, which may have a fatal

outcome, thus supporting the dictum of Hamilton and Thomson (1941) that "any cardiac' may fail at any time."

It was noted, too, that 3 out of the 4 patients in this series who went into labour and who died, had a pulse of over 112 during the first stage of labour: and one recalls again Mendelson's advice on the value of recording the pulse-rate in the first stage of labour and on the exhibition of digitalis.

Jensen (1938), commenting on the time of death in heart cases, said that the commonest time was between the 5th and 28th day after delivery, and he found congestive heart failure to be the cause of death in at least 70 per cent of the cases he reviewed. Sheehan and Sutherland (1940), asking whether the deaths are the result of an acute myocarditis or an acute endocarditis, found that nearly all of their obstetric patients, whose hearts had been decompensated, or who died cardiac deaths, had recurrent endocarditis (i.e. fresh vegetations on the heart valves). The question further arises whether the recurrent endocarditis, which is associated with a myocarditis which may lead to congestive failure, causes or is caused by the decompensation, or whether both are a result of a third unknown factor. Jensen (1938) could not, however, find convincing evidence that pregnancy shortens the life of patients with chronic valvular disease; and if, as Sheehan and Sutherland (1940) suggest, pregnancy is the exciting cause of the recurrent endocarditis, such a shortening of life might be expected with the further scarring of the valves or from emboli. Of the fatalities recorded in this series, 71.4 per cent were due to congestive failure; and as regards the time of death, 2 patients died at the end of the third stage of labour; 2 in the puerperium, I on the 3rd and I on the 15th day after premature spontaneous delivery; I died undelivered at the 32nd

week; I three weeks later after hysterotomy at the 18th week of pregnancy, and I the 3rd day after a Caesarean section.

#### THE PUERPERIUM.

Puerperal infection is a grave danger with its risk of organisms settling on the damaged heart valves, and subacute bacterial endocarditis is a not uncommon cause of death at this time. In 1937 I drew attention to the possibility of postmortem culture of the damaged heart valves showing the existence of a higher proportion of bacterial endocarditis than would otherwise be found. In some American clinics this danger from puerperal infection is considered serious enough to promote the use of prophylactic chemotherapy immediately after labour.

Patients whose hearts have decompensated-those in Groups III and IV-should be on an hourly pulse-chart during the first puerperal week, and any change in rate or rhythm carefully watched for. Examination of the records of the present series shows that the pulse does not usually settle down until the 10th to the 14th day, and since it is found that the sleeping pulse is typically slower, sedatives should be given to ensure long and restful sleep, and worry avoided. At the end of 14 days, provided that the pulse has settled and the patient is otherwise well, she is permitted to get out of bed, and slowly increase the ambulatory period during the ensuing week, being fit for discharge from hospital usually by the end of the 3rd week.

Nursing the baby on the breast is a hazardous task, for which neither Group III nor Group IV cardiac patients are fit, and bottle-feeding should be established in such cases.

### Prognosis.

The task of giving an accurate prognosis of the course of pregnancy in a woman suf-

fering from heart disease is notoriously difficult, and opinions have to be given with caution. Since most of the fatalities occur, as mentioned, in the puerperium, judgment must be withheld until that period is passed.

It is true that the large majority of patients, in whom physical disability is slight, will go through pregnancy without undue risk. It is equally true, however, that the strain of pregnancy and labour may be fraught with danger, or even prove fatal to some women who have hitherto enjoyed a fairly active life; and at a follow-up of some of these patients it was found that those who showed a deterioration during their pregnancy were in a less favourable group than those who remained well.

Rheumatic heart disease is itself progressive and the life of the patient draws inexorably to an early close while still often in its prime. This would help to explain, in some instances, the severity of the condition and also the fatalities encountered in the young primigravida.

Gilchrist and Murray-Lyon (1933) say that repeated pregnancies tend to shorten the span of life in women suffering from rheumatic heart disease and ultimately to increase the risk of death from congestive heart failure; but while pregnancy should be avoided in the severer grades, they conclude that one or two pregnancies do not shorten the expectation of life in the majority of patients with heart disease.

The prognosis has, too, greatly improved, with better antenatal and intrapartum care and, although this is still incomplete, with the better understanding of the behaviour of the heart under the burden of pregnancy. Towards this end the functional classification of the American Heart Association is considered to be one of the best prognostic indices and guides to treatment, but further study may show that even it may require modification.

All observers agree that the danger to be avoided is decompensation of the heart and, while the treatment of cardiac failure is preventive, keeping a close watch on the patient and interrupting the early pregnancy if there is no improvement in 2 to 3 weeks, it is the development of heart failure in the Group II patient which is a disturbing feature. It is possible, to explain this. that patients in both Groups I and II, being relatively in good health, are not sufficiently warned about the physical limitations associated with their condition and tend to do foo much, or are not seen at sufficiently frequent intervals, so that any deterioration in their condition progresses unobserved. In how many antenatal clinics to-day is it common to find the patient with heart disease reporting at 3- or even 4-weekly intervals during her pregnancy? It may be, therefore, that if the warning signs of decompensation were assiduously sought for at weekly intervals, failures would be fewer and the dictum of Hamilton and Thomson (p. 194) will be changed to "any uncared for 'cardiac' may fail at any time." Another possible means of preventing cardiac decompensation is the strong advocacy of stubborn medical care, outlining the daily routine with the exact amount of work and rest for each patient, and an insistence on its strict observance. Patients who have shown signs of cardiac failure and are proceeding with the pregnancy should undoubtedly be advised to stay in hospital until safely delivered.

The second point I would like to make is that the lowered mortality owes no little to the better choice of patients who are allowed to proceed with pregnancy. In the early months of pregnancy the Group IV patients, and those in Group III who do not improve with treatment, the patients with auricular fibrillation, and those with a history of previous attacks of heart failure should be advised to have the

pregnancy terminated. Termination of pregnancy is, however, always so serious an undertaking that there is no doubt that the responsibility devolves upon cardiologists to advise and instruct their Group III and IV patients against becoming pregnant.

The third point concerns the actual delivery of the patient. This should, with few exceptions, undoubtedly be by the vaginal route in all groups where rheumatic heart disease is the sole complication.

There is finally the important question of the aftercare of the patient. The old saying is true, that the babe in the crib is a greater danger than the babe in the womb: and the unending toil and burden of the daily task may well prove too much for the damaged heart and needlessly shorten the patient's expectations of life. Assistance from the Home Help Scheme should, therefore, when necessary, be arranged, and a sympathetic health visitor advise the patient on the social limitations of her life. Arrangement should also be made for the woman's attendance at a cardiac clinic, where she will receive periodic supervision and guidance on a further pregnancy.

In the Ingleby Lectures of 1931, Blair Bell, discussing "the terrible role of disablement which follows in the wake of motherhood," said that to per cent of mothers were more or less crippled as a result of childbearing and he advised, with far vision, that lives could be saved not only by skilled antenatal care but, as in the case of heart disease, by preventing in childhood the onset and development of the illness.

The maternal - death-rate from heart disease is high, but it is steadily falling, and with Blair Bell's advice in mind and with earnest co-operation between cardiologist and obstetrician, still better results await us.

#### SUMMARY.

In the review of 29,713 patients who attended Queen Charlotte's Maternity Hospital during the decade 1937 to 1946 the total number with heart disease was 225, an incidence of 0.8 per cent.

Thirteen of the patients had congenital heart lesions, and a definite history of rheumatic heart disease was obtained in 91.5 per cent of the remainder.

The maternal mortality rate in the series was 3.1 per cent. The stillbirth rate was 3 per cent, corrected to 1 per cent, and the neonatal death rate was 2 per cent.

Heart disease was shown to be gaining a more prominent position as a cause of maternal death, accounting for II.5 per cent of the maternal deaths from all causes, during the 10 years reviewed.

Change of group during pregnancy, especially at about 28 weeks, was not uncommon, but complete rest in bed was usually sufficient to restore the patient to her original group.

Admission to hospital at the 28th week of pregnancy for complete rest and assessment and again a week before term is advised for all heart cases.

The importance of antenatal care has been stressed in order to obtain assurance that the patient is carrying out the strict regime set out for her and to discover immediately the early signs of cardiac decompensation.

Therapeutic abortion is advised for patients in Groups III and IV who do not improve in early pregnancy, and for those seen at this time with auricular fibrillation, or who give a history of previous heart failure.

Vaginal delivery is considered best for patients with heart disease in the absence of any other complication.

Caesarean section has however a definite place where dystocia is anticipated. The

dangers of prolonged labour and accouchement force in heart disease are also emphasized.

The patients in this series who died were all primigravidae; and it was noted that out of 131 primigravidae 9.9 per cent were in Group IV, and out of 81 multiparae only 4.9 per cent were in Group IV.

The average age of the patients who developed decompensation was 29.8 years, 70 per cent developing heart failure after the 24th week of pregnancy.

The failure of the Group II patient is considered a real danger, and this complication is discussed.

The Home Help Scheme to relieve the arduous daily tasks of the mother, both in the antenatal and postpartum periods, has an essential place in the treatment.

I wish to acknowledge the kindness of Members of the Honorary Staff, who have given me access to their cases.

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## ROYAL COLLEGE OF OBSTETRICIANS AND GYNAÉCOLOGISTS

### LEVERHULME RESEARCH SCHOLARSHIPS

Through the generosity of the Leverhulme Trust the Council is in a position to grant two scholarships of £500 a year each, renewable for a second and third year, for the purposes of research into problems connected with obstetrics and/or gynaecology.

The scholarships may be held simultaneously with another appointment if, in the opinion of the Council, sufficient time is available for research.

Regulations governing these grants and forms of application can be obtained from the Secretary, 58, Queen Anne Street, London, W.I. The last day for receiving applications on the prescribed form is 1st July, 1948.

#### BOOK REVIEW

"Catalogue of Medical Films." Aslib, London, 1948. Pp. 125, 7s. 6d. (6s. to Aslib members.)

This volume, compiled by the Royal Society of Medicine and the Scientific Film Association, contains the title list of 800 films with fuller details of 200. All the latter group, which includes several on obstetrical, gynaecological and kindred subjects, are available for loan purposes. Many of the remaining 600 are also available. The present catalogue is to be regarded as interim and a fuller publication is promised at a later date.

# AN INTERNATIONAL CONGRESS ON OBSTETRICS AND GYNECOLOGY

Reprinted from American Journal of Obstetrics and Gynecology, Vol. 55, No. 1, January, 1948.

In a previous editorial (November, 1947), we commented upon the desirability and importance of holding an international congress devoted to this important field of medicine. It is of interest to report that the Board of Directors of the American Committee on Maternal Welfare have agreed to sponsor such a conference in conjunction with the Fourth American Congress, and it was decided to hold it in New York City at the Hotel Pennsylvania, May 14 to 19, 1950. The place of meeting is the metropolis of the Western world, and is readily accessible by accepted modes of travel from all parts of the globe.

Preliminary plans include a program in which each morning of the four-day scientific sessions is to be devoted to formal presentation and discussion of a general topic. The afternoon sessions are to be given over to round table and informal discussions of these subjects. Tentatively selected are cancer of the female genitals, physiology and pathology of reproduction, and gynecologic procedures.

The field of obstetrics and gynecology involves wide implications, therefore it is important to include all interested groups—doctors, nurses, hospital administrators, public health personnel, and medical educators. An additional session at the close of the conference may be devoted to a presentation of economic and sociologic problems under the auspices of the National Federation of Obstetric-Gynecologic Societies.

In addition to the academic presentations to be made at the Congress there will be extensive technical and scientific exhibits, as well as social events. There will be opportunities for the participants from foreign countries to mingle with each other, peacefully to discuss their problems, and to become acquainted. There is nothing more likely to develop progress and interest in the advance of the speciality than such harmonious personal contacts. In conjunction with the Congress, it is likewise planned to develop clinics in various of the larger medical centers and hospitals of the country both before and afterwards, so that foreign visitors will have an opportunity to acquaint themselves with the advances of American institutions in this field.

Further details of the various activities will be announced as soon as plans are developed.

The executive offices of the Congress are located at 24 West Ohio Street, Chicago 10, Illinois, U. S. A., and all inquiries should be addressed to the General Chairman, Dr. Fred L. Adair.

The American profession is pleased to welcome the visitors to what is looked forward to as an unequaled opportunity for the advance of this important branch of medicine, for the commingling of people inspired by the same endeavors can only bespeak progress in a subject of global interest, for womenkind, healthy and well, means world-wide happiness.

#### REPORTS OF SOCIETIES

## INTERNATIONAL SOCIETY OF HEMATALOGY

The International Society of Hematology will hold its bi-annual meeting at the Hotel Statler in Buffalo, New York, 23rd to 26th August, 1948.

The following time has been tentatively allotted for symposia and presentations: half day on general subjects, including radio-active and stable isotopes in haematology; half day for problems and diseases related to the red cells; half day for problems and diseases related to white cells; I day for immuno-haematology, Rh-Hr (CDE-cde) antigens and antibodies, and haemolytic anaemias; half day for coagulation problems and haemorrhagic diseases; and half day for business meeting.

Scientific exhibits will be presented in the south wing of the 17th floor of Hotel Statler. Applications for the presentation of scientific exhibits are now being received by Dr. O. P. Jones, Department of Anatomy, University of Buffalo, Buffalo, New York. Chairman of the Programme Committee is Dr. Ernest Witebsky, Buffalo General Hospital, Buffalo, New York.

Dr. Eduardo Uribe Guerola, Leibnitz No. 212, Nueva Colonia Anzurez, Mexico, D.F., is in charge of the programme from South and Central America and Sir Lionel Whitby, University of Cambridge, England, is in charge of arrangements for the programme from Europe. Communications concerning applications for the programme will be received by the above-named committeemen.

All scientific sessions and exhibits will be open to scientists interested in haematology. This will, of course, include members of the medical profession, and those branches of science dealing with haematology, such as biochemistry, biophysics, genetics, immunology, etc.

Communications and applications concerning membership will be received by the following members of the membership committee: Dr. William Dameshek, Chairman, 25 Bennett Street, Boston, Mass., for U.S.A.

Dr. M. Bessis, Laboratoire de Recherches, Du Centre National de Transfusion Sanguine, 53 Boulevard Diderot, Paris, France.

Dr. Robert R. Race, Lister Institute, Chelsea Bridge Road, London, S.W.I., England.

Dr. Ludwik Hirszfeld, Institute of Medical and Microbiological Science, Wroclaw, Poland.

Dr. Ignacio Gonzales Guzman, University of Mexico, College of Medicine, Mexico, D.F., Mexico.

Dr. Walter Cruz, Instituto Oswaldo Cruz, Caiza Postal 926, Rio de Janerio, Brazil.

Dr. Alfredo Pavlovsky, Ancherena 1710, Buenos Aires, Argentine.

Dr. Theodore Waugh, McGill University, Montreal, Quebec, Canada.

Dr. Berger Broman, Royal Caroline Medical school, Stockholm, Sweden.

Dr. C. R. Das Gupta, Hematology Department, Calcutta School of Tropical Medicine, Calcutta, India.

Dr. Luis Sandoval S., Instituto de Histologica de la Universidad de Concepsion, Santiago, Chile.

Dr. Rod Sirivejkul, Army Medical Department, Bangkok, Siam.

Dr. Carl Rohr, Medizinischen Universitatsklinik, Zurich, Switzerland.

Dr. Moises Chediak, Laboratories Chediak, 23 No. 654 Esq., A., Banos Vedado, Habana, Cuba.

Dr. G. di Guglielmo, Director of Medical Clinics, University of Naples, Policlinico, Napoli, Italy.

Dr. Henrik Dam, Danmarks Tekniske Hojskole, Biologisk Afdeling, Ostervolgade 10'' Trappe L., Kobenhavn, Danmarks.

Those interested in attending the meetings may communicate with Dr. Sol Haberman, Secretary, The William Buchanan Blood Centre, Baylor Hospital, Dallas, Texas.

#### REVIEW OF CURRENT LITERATURE

The Journal is fortunate in being able to run this Review in conjunction with the Abstracting Service of the British Medical Association. All the abstracts of this service which cover obstetrical and gynaecological literature and literature on the new-born are at our disposal. The Review will, however, contain in addition abstracts of articles which, though not of sufficient general interest for publication in the monthly volumes published by the British Medical Association, are yet sufficiently important for a specialist journal. It is to be hoped that our readers will collaborate in the preparation of these abstracts. Those who are willing to take part in the service are invited to communicate with the Editor, The Abstracting Service, B.M.A. House, Tavistock Square, London, W.C.I. There is special need of abstracters in foreign languages, and when offering his or her services the writer should indicate the language (apart from English) in which he or she is proficient. The name of the abstracter will be acknowledged in the text and payment will be made at the rate of thirty shillings per thousand words.

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#### ANATOMY.

246. Standardized Radiological Pelvimetry. III. A new Method of Measuring the Outlet.

By E. P. Allen. Brit. J. Radiol., 20, 164-169, Apr. 1947. 7 figs., 8 refs.

In the third of his series of four articles, the author deals with comparatively neglected measurement of the pelvic outlet. The plane of the outlet is likened to a sling made by joining two isosceles triangles base to base, this line of junction being the most dependent part, and represented by the inter-tuberous diameter. The sides of the posterior triangle are formed by the sacro-tuberous ligaments and those of the anterior triangle by the descending pubic rami. It is argued that, though the size of the sub-pubic angle has clinical significance, such significance must be related to the space available posteriorly, which is determined by the position of the lowest fixed point of the sacrum.

The author has therefore set himself to devise a measurement which should be a function both of the sub-pubic angle and of the posterior sagittal diameter. To this end he has employed in the first place his "symphysis-biparietal" distance (Brit. J. Radiol., 1943, 11, 279). This is the length measured from the under surface of the symphysis (on a special film of the sub-pubic arch) to the transverse diameter of a semi-circular transparency, which represents the anterior half of the foetal head. The measurement is made when the semicircle is placed within the arch and is in contact with its sides (Fig. 1). This measurement gives the most anterior point at which the head will negotiate the sub-pubic arch. The only posterior obstruction is the tip of the fixed sacrum. The distance, therefore, from the point mentioned to the sacral tip is

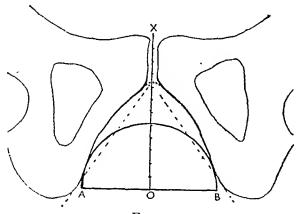
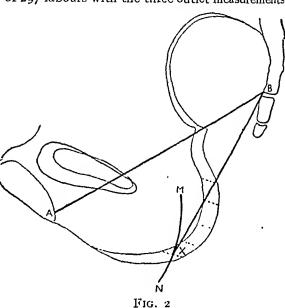


Fig. 1

Transparency applied to film of sub-pubic arch. AB is 103 mm. long. OX is a true centimetre scale at right angles to AB, and reads the symphysisbiparietal distance from O to the lower edge of the symphysis. Broken lines illustrate method of measuring sub-pubic angle. The semicircle represents the anteriorly-placed half of the foetal head.

termed the available posterior sagittal diameter (Fig. 2).

Graphs are given correlating the observed results of 297 labours with the three outlet measurements,



Lateral view of lower pelvis (schematic) showing the construction necessary for measuring the available posterior sagittal diameter. AB anteroposterior of midplane. MN, locus of biparietal diameter of skull in its most anterior position. BX, available posterior sagittal of outlet. Broken lines are drawn parallel to line joining tips of ischial spines.

sub-pubic angle, posterior sagittal diameter, and available posterior sagittal diameter. These show that the critical value of the first two of these measurements is ill-defined, since the slope from the 100 per cent normal deliveries to the 100 per cent obstructed labours is gradual. Prognosis can therefore not be more than very approximate. In contrast, in the graph for the available posterior sagittal diameter, the slope is steep about the critical figure of 54 mm., allowing an exact prognosis in 70 cases out of 100.

A. M. Rackow

247. Roentgenography and Roentgenometry of the Pelvis.

By H. THOMAS. J. Mt Sinai Hosp., 14, 653-658, Sept.-Oct., 1947. 5 figs., 3 refs.

248. Radiography of the Lymphatic System of the Uterus. (Radiographie du système lymphatique de l'utérus.)

By C. VARADY. Schweiz. med. Wschr., 77, 500-

510, May 3, 1947. 3 figs.

During the performance of a utero-salpingo-graphy with "jodipin" (an iodized oil similar to lipiodol ") the lymphatics of the uterus were permeated by the oil and clearly outlined on the radiograph. The rate of progress along the lymphatics appeared to be approximately 10 cm. per hour, and the internal iliac lymph nodes were radiologically demonstrable after 50 minutes. The inguinal and sacral nodes did not fill at all (the last radiograph was taken 3 days after the introduction of the oil). No ill-effects were seen either at the time of the injection or later, although the patient disregarded medical advice and insisted on remaining active and up. This unusual occurrence is comparable to the occasional filling of the uterine veins during lipiodol introduction.

Nicolas Tereshchenko

249. Genesis and Topography of the Pelvic Plexus. By A. Z. Kochergisky. Akush. Ginek., No. 5, 28-31, 1947. 3 figs.

#### PHYSIOLOGY.

250. Failure of the Liver of the Monkey to Inactivate Estrogens in vivo.

By C. W. Hooker, V. A. Drill, and C. A. Pfeiffer. Proc. Soc. Exp. Biol., N.Y., 65, 192–194,

June 1947. 29 refs.

Intrasplenic implantation of pellets of oestrone and oestradiol in 4 ovariectomized monkeys was followed by reddening of the sex skin and alteration of the vaginal smear as promptly and with the same intensity as in a control animal given oestradiol benzoate intramuscularly. Endometrial changes in the animals were alike and removal of the intrasplenic pellet was followed by typical oestrogendeprivation menstruation. Liver function tests revealed no hepatic damage and administration of B vitamins did not reduce the activity of the intrasplenic oestrogens.—[Authors' summary.]

251. Regulation of Pituitary Gonadotrophic Secretion; Inhibition by Estrogen or Inactivation by the Ovaries?

By E. C. Jungck, C. G. Heller. and W. O. Nelson. *Proc. Soc. exp. Biol.*, N. Y., 65, 148-152,

June 1947. 3 figs., 8 refs.

The concept that the normal level of circulating oestrogen inhibits pituitary gonadotrophic secretion has long been the accepted explanation for control of the ovarian-pituitary mechanism. However, administration of oestrogens in physiological amounts after castration or the menopause will not lower the rise in urinary gonadotrophins that occurs without such therapy. Data are presented in this communication indicating that the rise in gonadotrophins following castration is principally due to lack of gonadotrophic inactivation and only in part due to lack of inhibition by oestrogen. The concept that a target organ inactivates the specific hormone stimulating it is not new and has already been postulated for the thyroid-pituitary relationship. Thymus, ovaries, uterus, and vaginal smears were studied in normal adult virgin rats and castrate controls and compared with a group subjected to autotransplantation of both ovaries into the spleen. In this group the ovary continues to be bathed by pituitary gonadotrophins but the pituitary is no longer bathed by oestrogens, because in essence the liver has been inserted between the ovaries and the pituitary and has inactivated the oestrogens. Lack of circulating oestrogen was demonstrated by the thymic and uterine weights and the histology of the vaginal cells. The level of pituitary gonadotrophin was slightly but significantly higher than in the normal animals, though not nearly as high as in the castrate group. In some cases where the autotransplantation had been carried out a collateral circulation developed from the spleen to the systemic circulation by way of adhesions. These cases acted as admirable controls, for it could be shown that vaginal smears and uterine development were identical with those of intact animals. Administration of large doses of oestradiol to the transplanted animals caused total suppression of pituitary gonadotrophins with ovarian atrophy.

The authors conclude that: (1) ovaries normally inactivate gonadotrophins, and the rise of gonadotrophins after castration is due to failure of such inactivation to take place; (2) large and unphysiological doses of oestrogen are powerful inhibitors of pituitary gonadotrophic potency; and (3) physiological amounts of oestrogen in the circulation exert very little inhibitory action on the pituitary.

Doreen Daley.

252. Comparative Study of Synthetic Oestrogens and Oestradiol Benzoate. I. Their Action on the Pituitary Gland, Adrenals, Thyroid, and Ovary of the Rabbit. (Ricerche comparative fra gli stilbeni ed il benzoato di diidrofollicolina. I. La loro azione sull'ipofisi, surrene, tiroide ed ovaio di coniglia.)

By T. Paladino. Ginecologia, Torino, 13, 227-

256, May 1947. 4 figs., Bibliography.

The rabbits used in the author's experiments weighed approximately 1,500 g. and were sexually mature; all except 6 were sterilized. A first group was treated with 0.03 or 0.1 mg. of oestradiol benzoate daily; a second group with the same doses of synthetic oestrogens (stilbenes) daily, stilboestrol and stilboestrol-dipropionate being used (0.03) mg. of hormone is equivalent to 300 i.u., which corresponds to 1 mg. given daily to a woman weighing 55 kg.). The animals were kept under experiment for periods ranging from 35 days to 1 year. Some of them were killed 35 days, 6 months, and 1 year after the beginning, and others 6 months after the end, of the treatment. The rabbits killed after 35 days had begun treatment a month after they were sterilized, the others 5 days after sterilization.

The administration of 0.03 or 0.1 mg. of oestradiol benzoate for 35 days restored the normal histological aspect of the pituitary gland of sterilized animals. The stilbenes were more active: 0.3 mg. was sufficient to bring the pituitary gland back to normal; 0.1 mg. was an overdose, and moderate signs of cellular alteration were found on histological examination. Signs of progressive and regressive alteration of the gland were found in

rabbits treated for 6 months with stilbenes, and were even more evident in those treated for I year. Such changes in the pituitary gland were also found in the rabbits treated for I year with oestradiol.

Low doses of hormone within a certain time limit stimulate pituitary function, but produce inhibition

if administration is prolonged.

The hyperfunctioning adrenal glands of sterilized animals were brought back to normal after 35 days of administration of 0.03 or 0.1 mg. of both drugs. A normal histological aspect is maintained with the administration of 0.03 or 0.1 mg. of oestradiol for 6 months. Hyperfunction of the gland is found after administration of 0.03 mg. of stilbenes for the same period; hypertrophy and hyperplasia of all the elements of the zona glomerculosa occur when o.r mg. is used. Regressive changes, with a probable hypofunction of the gland, were found after I year of treatment with stilbenes and oestradiol. All the changes are reversible; the adrenal glands of the rabbits treated for I year and killed after a further 6 months were histologically almost normal.

The author showed that the thyroid of sterilized animals is hyperfunctioning, but 0.03 or 0.1 mg. of oestradiol produced a progressive hypofunction of the thyroid after 35 days, 6 months, and 1 year. Hypofunction was found in rabbits treated for 35 days and 6 months with stilbenes in both doses; after I year's treatment with stilbenes the gland

was histologically hyperfunctional.

Six non-sterilized rabbits were used for the study of the ovary. Two were treated with daily injections of 0.03 mg. of oestradiol benzoate, 2 with the same dose of stilboestrol, and 2 with a triple dose of stilboestrol. All the animals were killed after 6 months' treatment. Oestradiol and 0.03 mg. stilbene produced inhibition of development of primordial follicles and degeneration of the ovum and granulosa cells. The triple dose of stilbene produced the same lesions. The changes produced on the endocrine glands by the experiments were reversible. No difference in action was found between stilboestrol and stilboestrol propionate.

R. Saunders

253. Oestrogenic Value of the Remaining Ovary. (Valor estrogénico del ovario restante.)

By M. A. CIRIO MALBRAN. Obstet. Ginec. Lat.amer., 4, 873-895, Dec. 31, 1946. 10 figs., Biblio-

graphy.

After discussing the various methods for determining the hormone secretion of the ovary, the author describes in detail his method of estimating the oestrogenic value of the ovary after removal of the uterus and tubes. In 21 rats the uterus and tubes were removed but the ovaries were left and care was taken to preserve their blood supply and anastomotic circulation. After a delay of 160 to 180 days, so as to avoid that period of ovarian hyperactivity which is considered by some authors to follow hystero-salping ectomy, the ovaries were removed and transplanted in decreasing amounts by weight into the cellular tissue of the back of 9 rats which served as test animals. In a control series of 6 rats ovarian tissue was transplanted from 8 rats which had not been operated on. Vaginal smears were taken twice daily for 30 days in order to determine the occurrence of oestrus, and the ovarian tissue was then examined histologically.

It was found that to produce oestrus a minimum weight of 10 mg. of ovarian tissue from animals which had undergone hystero-salpingectomy was needed, compared with about 30 mg. of ovarian tissue from healthy animals. The author therefore concludes that the oestrogenic value of the single ovary following hystero-salpingectomy is about half that of the ovary of a normal animal. This method makes it possible to determine the minimum oestrogenic value of the ovary. The presence or absence of oestrus will depend on the activity of the ovary, as indicated by the histological changes found; and the oestrogenic activity of the implanted tissue will depend upon its functional state at the moment of Bryan Williams implantation.

254. Regulation of Ovarian Growth: Inhibition by Estrogen or Stimulation by Gonadotrophins?

By C. G. Heller and E. C. Jungck. Proc. Soc. exp. Biol., N.Y., 65, 152-154, June 1947. 2 refs.

Evidence is presented to indicate that oestrogens secreted by the ovary inhibit ovarian growth. As in a previous investigation (Abstract No. 251), auto-transplantation of the ovaries to the spleen was carried out. The ovarian weights increased threefold after 30 to 57 days' transplantation. Relatively normal gonadotrophin levels indicated that increased gonadotrophic stimulation was not responsible for the ovarian hypertrophy. In those cases in which vascular adhesions to the systemic circulation developed, the ovaries did not increase in size. The observation indicated to the authors that the inhibition of ovarian growth was due to circulating oestrogen in the blood. They produced further evidence to support this view by injecting oestradiol benzoate into the transplanted animals. Both large doses and physiological amounts produced a marked decrease in ovarian weights as compared with the weight at the time of operation. Doreen Daley

255. A Study of the Physiologic Action of Human Chorionic Hormone. The Production of Pseudopregnancy in Women by Chorionic Hormone.

By W. E. Brown and J. T. BRADBURY. Amer. J. Obstet. Gynec., 53, 749-757, May 1947. 7 figs.,

7 refs.

Because the literature on chorio-gonadotrophic hormone deals mainly with laboratory studies, and its clinical use has been based on the application of laboratory theories to patients with alleged physiological derangement of menstruation, the authors set out to study the effect of the hormone on normal women. In large doses it induced pseudopregnancy with persistence of the corpus luteum, decidual changes in the endometrium, prolonged secretion of pregnanediol, and a positive Aschheim-Zondek test. In a survey of the literature it is noted that doses of 500 rat units daily produced no constant effect on the corpus luteum; the authors therefore decided to give 10,000 to 20,000 i.u. daily, in imitation of the amount of the hormone which might be expected to be circulating in the normal woman in the first 2 weeks of pregnancy.

In view of the large volume required for the projected dosage and the occurrence of local reaction with ordinary doses, the hormone was used as a powder in a phosphate buffer solution (pH 7.4), each ml. containing 5,000 i.u.; the solution was sterilized by passage through a Jena filter. No preservative was used, and check assays on immature rats revealed the expected potency of the solution. Women with normal menstrual cycles were studied and endometrial biopsies were made once or twice weekly. The Astwood and Jones method of estimating the urinary pregnanediol was used; in some patients admitted for laparotomy direct observation of the ovaries was possible. There were no marked general or local reactions to the injections. With 20,000 units daily pseudo-pregnancy could be established but bleeding occurred, in spite of continued injection, about 3 weeks later. The minimum dose which could produce this effect was 5,000 units daily, though with this dosage the Aschheim-Zondek reaction was negative, indicating that (1) in a normal pregnancy the developing trophoblast must produce over 5,000 i.u. daily before the reaction can be positive, and (2) a normal pregnancy may maintain the corpus luteum in the early days despite a negative reaction.

The effect of chorionic hormone in the pre-ovulatory phase was studied in 5 patients, 10,000 units being given daily. No effect was observed except in I case, in which menstruation was delayed and a decidual reaction produced. The authors consider that the hormone has little influence on this phase of menstruation. Two cases are recorded in which the hormone was given 24 hours before the expected period; bleeding was not delayed, and they conclude that the hormone was unable to revive an already involuting corpus luteum. One ovariectomized patient was given oestrogen and then progesterone until the endometrium was in the secretory phase; chorionic hormone, however, failed to delay the bleeding which followed. This suggests that its influence is exerted on the ovary and not directly on the endometrium.

The action of this placental hormone is thus limited to the maintenance and development of an existing corpus luteum, and there is no evidence that it hastens the onset of luteal function. Choriogonadotrophic hormone is peculiar to mammals, is probably species-specific, and might be used in the treatment of certain forms of abortion, sterility, and menorrhagia. It is suggested that the usual clinical dose is too small to produce any satisfactory results.

Hugh R. Arthur

256. Pharmacodynamic Study of the Action of Amidopyrine on the Smooth Muscle of Intestine and Uterus. (Estudio farmacodinámico de la aminopirina sobre la musculatura lisa intestinal y uterina.)

By J. A. IZQUIERDO. *Prensa méd. argent.*, 34, 1369-1376, July 25, 1947. 25 figs., 6 refs.

In various concentrations (I: 20,000 to I: 2,500) amidopyrine has an inhibitory action on the smooth muscle of the isolated small intestine of the cat, rabbit, and guinea-pig, different doses in different parts of the intestine diminishing the tone, and the frequency and amplitude of the contractions. The drug antagonizes parasympathomimetic drugs and histamine. Adrenaline does not interfere with its action. Antidopyrine depresses the contractions of the duodenum of the intact cat in doses of 50 mg. per kilo intravenously and antagonizes carbaminoylcholine. These doses are convulsant. In the spinal animal, prepared by the bulbar injection of 2 ml. of 10 per cent procaine, the amplitude of duodenal contractions is diminished and the tone increased by doses of 60 mg. per kilo. The effect of carbaminovlcholine is attenuated.

In low concentration the isolated non-gravid uterus of the cat and of the rabbit is stimulated. Low concentrations depress the gravid guinea-pig uterus. High concentrations (1:1,000) depress the non-gravid cat uterus, antagonizing histamine. The drug has a slight anti-parasympathomimetic action on the isolated guinea-pig uterus and does not inhibit the oxytocic hormone. These actions on the smooth muscle of the intestine and uterus are due to an unexplained local effect and are independent of central nervous connexions.

L. P. R. Fourman

257. The Physiologic Basis of Menstruation: A Summary of Current Concepts.

By S. R. M. REYNOLDS. J. Amer. med. Ass., 135, 552-557, Nov. 1, 1947. 8 figs., 17 refs.

258. Determination of the Premenstrual "Safe Period" by the Temperature Curve. (Détermination de la période stérile prémenstruelle par la courbe thermique.)

By J. Ferin. *Brux-Méd.*, **27**, 2786–2793, Dec. 21, 1947. 4 figs., 28 refs.

259. Morphological and Functional Behaviour of the Exocrine Glands of the Skin of the Axilla during the Phases of the Menstrual Cycle and in Pregnancy. (Indagini sul comportamento morfo-funzionale della ghiandole glomerulari apocrine della pelle dell'ascella durante le fasi del circlo menstrualé e nella gravidanza.)

By P. CAVAZZANA. Riv. ital. Ginec., 30, 114-134, 1947. 8 figs., 61 refs.

260. Study of the Human Vaginal Smear. II. The Vaginal Cycle. III. Effect of Oestrogens and Progestins on the Human Vaginal Smear in Cases of Oestrogen Deficiency. (Etude du frottis vaginal chez la femme. II. Le cycle vaginal. III. Les effets des sub-

272. Effects of Various Sex Hormones on Excretion of Pregnandiol Early in Pregnancy.

By E. M. Davis and N. W. Fugo. Proc. Soc. exp. Biol., N.Y., 65, 283-289, June, 1947. 8 figs. 3 refs.

Smith and Smith reported that the administration of diethylstilboestrol during pregnancy in-creased the urinary pregnanciiol excretion, and concluded that synthetic oestrogens increased the amount of available progesterone by stimulating steroid metabolism in the placenta. They used increasing amounts of diethylstilboestrol with the idea of preventing abortion and the accidents of

late pregnancy.

The purpose of the present investigation is (1) to determine if the sex hormones will increase the production of progesterone by the placenta in early pregnancy, and (2) to study human foetuses from mothers who have received large amounts of these substances in order to establish that no untoward changes have resulted. The group of patients studied comprised 15 women with normal pregnancies. In 7 cases therapeutic abortion had to be carried out at 12 to 16 weeks, and 1 woman aborted spontaneously at 14 weeks. The others were delivered at term or are continuing their pregnancies.

Ten patients received 50 to 200 mg. diethylstilboestrol orally each day for 6 to 8 weeks, starting at 4 to 10 weeks' gestation. In the entire group it was apparent that there was no alteration in normal curve of urinary pregnanediol. The authors consider, however, that diethylstilboestrol may have a profound effect on a pregnancy by improving the utero-placental circulation. Testosterone was administered to 2 patients. Injections of 50 mg. of the hormone in oily solution were given daily for 25 or 26 doses, starting in 1 case at 15 weeks and in the other at 13 weeks. When the pregnancy was terminated shortly after cessation of treatment there was no evidence of foetal abnormality. Signs of virilism appeared after 1,000 mg. of testosterone had been given. The androgens did not influence the pregnanediol excretion. Progesterone was given to 3 patients, starting at 5, 7, and 10 weeks' gestation; 50 mg. of progesterone in oil was injected intramuscularly daily for 3 days in 2 cases and a single injection of 120 mg. was given to the third. In each case there was an immediate increase in the excretion of pregnanediol, but the effect of the hormone disappeared within 24 hours of the last injection. If the increase in pregnanediol above the average amount excreted in each patient was calculated, about 30 to 35 per cent of the progesterone could be accounted for as pregnanediol, whereas in the non-pregnant woman only 10 per cent of the progesterone injected in the preovulatory phase can be recovered as pregnanediol.

The authors submit that if it is desirable to increase the amount of the progestational hormone available during pregnancy, it is more logical to administer progesterone in liberal amounts than diethylstilboestrol. However, it is their impression that there is no lack of progesterone in most of the pregnancies which threaten to end during the early months. Decreased pregnanediol levels may be an index of poor placental function.

Doreen Daley

273. The Parathyroids in Pregnancy.

H. J. STANDER and R. E. AHEARN. J. Mt Sinai Hosp., 14, 629-633, Sept.-Oct., 1947. 4 refs.

27.1. B-Glucuronidase Activity of the Blood and Tissues of Obstetrical and Surgical Patients.

By W. H. FISHMAN. Science, 105, 646-647, June

20, 1947. 1 fig., 4 refs.

It is believed that the function of 6-glucuronidase in vivo is the catalysis of glucuronide conjugation. In man, glucuronides of the oestrogens are excreted in the urine, and such conjugated oestrogens appear in large amounts during pregnancy. In 30 women the glucuronidase content of the blood cells increased steadily as pregnancy progressed and remained elevated for a short period after parturition: the enzyme content of the plasma, which is considerably lower than that of the cells, showed peaks of increased activity during pregnancy, falling to normal levels after parturition.

Since prolonged oestrogen administration may produce mammary tumours in animals, the β-glucuronidase activity of breast carcinoma was examined and proved to be ten to twenty times greater than that of the uninvolved breast tissue. A high content of the enzyme was also found in cases of carcinoma of the alimentary tract. No corresponding changes in the enzyme content of the blood were found. Only a few tumours have as

yet been examined.

O. L. V. de Wesselow

275. Leukocyte Counts in Normal White Women before and after Delivery.

By L. R. Cason and G. W. Phillips. Amer. J.

clin. Path., 17, 483-487, June 1947. 5 refs.

The leucocytes were examined in 57 normal pregnant women between 17 and 42 years of age-28 before and 29 after delivery. The average total leucocyte count, and the shift to the left in the Schilling haemogram (percentage of immature forms among the total neutrophil leucocytes), increased under 10 hours before delivery (from 10,275 to 13,742 per c.mm.; and from 12.6 to 24.9 per cent) until about 10 hours after delivery (17,960 per c.mm. and 29.7 per cent), subsiding thereafter to 12,560 per c.mm. and 18 per cent respectively. John F. Wilkinson

276. Biometric Observations on Arterial Pressure at the End of Pregnancy. (Osservazioni biometriche sulla pressione arteriosa nelle donne gravide a termine.)

By D. CAZZOLA and A. CHIARA. Ginecologia,

Torino, 13, 203-218, May 1947. 19 refs.

This investigation represents an original contribution to the important and controversial question of the behaviour of arterial blood pressure during pregnancy. The study was conducted in the Obstetric Clinic, Pavia, on 80 women near term, in good health and free from any complications of pregnancy. Systolic, diastolic, and pulse pressures were estimated and classified in tables, in relation to profession, degree of parity, constitution, and functional factors. The estimations were obtained with known biometric calculations, the Recklinghausen sphygmomanometer being used. The blood pressure was always taken during winter under the same conditions in the morning, with the patient fasting.

The subjects were first divided according to their work: housewife, factory-worker, and land-worker. A correlation exists between systolic blood pressure and the type of work. The highest systolic blood pressure is found in the land-worker, with an average of 118 mm., and the lowest in the factoryworker, with III mm. From examination of the standard deviation it is deduced that the class giving most uniform estimations is the factoryworkers; the least homogeneous class was the landworkers. The same results were found for the pulse pressure: the standard deviation of the factoryworker was 7.75, the lowest in relation to the other groups. The highest pulse pressure was in landworkers. The diastolic blood pressure was highest on the average in factory-workers (72) and lowest in land-workers (67). A table representing the average blood pressures in multiparae and primiparae shows that the systolic pressure in multiparae is higher (greater age); this and the pulse pressure are more homogeneous in primiparae (standard deviation 9.96, against 10.2 for multigravidae). The diastolic pressure is lower in multigravidae with an increase in pulse pressure which may be due to a lesser efficiency of the circulation. It is evident that there is a correlation between systolic blood pressure and parity.

Similarly, correlation is found between body constitution and systolic blood pressure. The pyknotic patients had higher, and the leptosomes lower, systolic and pulse pressures, than the average. A relation is also found between diastolic and systolic pressures and pulse rate. The subjects were divided into groups with pulse rates of less than 75, between 75 and 85, and above 85. With increasing pulse rate there is a gradual and parallel increase in systolic and pulse pressures, although the increase is very small. The diastolic pressure decreases with the increasing pulse rate.

R. Saunders

277. The Clinical Value of Determination of the Prothrombin Time in Gynaecology and Obstetrics. (Uber den klinischen Wert der Prothrombinzeit-Bestimmung in der Gynakologie und Geburtshilfe.)

By G. Schaefer. Zbl. Gynäk., 69, 126-127, 1947.

278. Prothrombin Level and Pregnancy. (Protrombina sanguínea y gestación.)

By I. M. ALVAREZ OSSORIO and M. FERNANDEZ. Toko-ginec. práct., 6, 296-300, Oct. 1947.

279. Obesity, Pregnancy, and the Puerperium. (Consideraciones sobre obesidad y estado grávidopuerperal.)

By A. STABILE. Obstet. Ginec. lat.-amer., 5, 393-407, Sept. 1947. 3 refs.

280. Structure of the Liver in Pregnancy. (Das Bild der Leber in der Schwangerschaft.)

By H. DIETEL. Z. Geburtsh. Gynäk., 128, 127-

162, 1947. 16 figs., 54 refs.

The changes in the structure of the liver during pregnancy were studied from biopsy fragments obtained by a puncture needle. These changes include an increase in the number of liver cells with two nuclei, increased deposition of glycogen and fat, and a variable content of stainable cholesterol. All of the changes were, however, inconsistent, and there is no justification for the term "pregnancy liver". Eclamptic livers showed great variations in the diameters of the capillaries, and a high glycogen content.

R. Willis

281. Galli Mainini's Reaction in the Early and Differential Diagnosis of Pregnancy. (La reacción de Galli Mainini en el diagnóstico precoz y differencial del embarazo.)

By P. FIGUEROA CASAS, L. BELIZAN, and J. J. STAFFIERI. Rev. Asoc. méd. argent., 61, 596-598, Aug. 15, 1947. 10 refs.

The search for a rapid, accurate, and simple test for early pregnancy has gone on since the description of the Aschheim-Zondek test in 1928. The original test required 100 hours, but other tests have reduced the time, down to the two-hour rat test of Kupperman, Greenblatt, and Novak. A test was described in 1930 in which immature male mice were used. Daily injections of pregnancy urine over a period of 8 to 10 days produced an increase in size of the genitalia. A similar test has been devised with male guinea-pigs. Reliable results were obtained in 100 hours.

In the Galli-Mainini test described in this article. the test animal is the male toad Bufo arenarum. Injection of the urine of pregnant women causes migration of spermatozoa and their expulsion in the urine. The authors describe the technique of the test. All the tests described were carried out in the autumn. Ten ml. of the urine to be tested was injected, and urine collected from the toads by means of a pipette inserted into the cloaca. The collected urine was examined under the microscope and in cases where the test was positive spermatozoa were seen in three hours. Positive results were obtained in 99 out of 100 cases of pregnancy. In the remaining case the Friedman reaction was positive. In 50 cases where there was no pregnancy, correct negative results were obtained. These

results were obtained in autumn, with a moderate temperature. The animals were lively and active. In colder weather they became more sluggish, but immersion in warm water restored activity and positive tests were produced where previously the reaction had been negative. The test appears to be accurate and positive results are easily recognized.

[All the biological tests for pregnancy depend on the presence in the urine of gonadotrophic substances. These appear very early in pregnancy. Since, so far, all the more reliable tests are biological, the problem is chiefly one of finding the most satisfactory experimental animal. Since gonadotrophic hormones act on the male as well as the female animal there is no theoretical reason why male animals should not prove suitable for the purpose. The test described here appears reasonably satisfactory, though the series of cases described is small. In using cold-blooded animals such as toads, it appears that the external temperature is important.]

282. An Evaluation of the Two-hour Rat Test for Pregnancy.

By P. H. FRIED. Amer. J. Obstet. Gynec., 54, 689-693, Oct. 1947. 30 refs.

283. The Huhner Test.

By M. Huhner. J. Mt Sinai Hosp., 14, 388-392, Sept.-Oct., 1947. 30 refs.

284. The Value of X-ray Studies of the Pelvis in Obstetrics.

By O. H. Jones. Amer. J. Obstet. Gynec., 54, 776-782, Nov. 1947. 6 refs.

285. Differentiation of Soft-part Shadows in Radiographs in Pregnancy. (Zur Differenzierung des Weichteilschattens auf der Schwangerschaftsaufnahme.)

By H. Deuel. *Radiol. clin., Basel.* 16, 325-332, Nov. 1947. 10 figs., 18 refs.

286. Diet in Pregnancy.

By W. C. W. NIXON. J. R. Inst. publ. Hlth., 11, 27-33, Jan. 1948.

287. An Analytical Survey of Eclampsia.

By J. B. Bernstine and L. N. Prince. Amer. J. Obstet. Gynec., 53, 972-979, June 1947. 4 figs., 5 refs.

This study merely substantiates the conclusions arrived at from other similar studies, that prophylaxis, education, and adequate prenatal care is the answer to the control and prevention of eclampsia.

—[Conclusions.]

288. Renal Filtration Rates in Pregnancy Toxemia: Inulin and Exogenous Creatinine.

By L. D. ODELL. Amer. J. med. Sci., 213, 709-

714, June 1947. 20 refs.

This investigation is based on a study of renal function in 15 women, 12 of whom were pregnant and had vascular syndromes. Of these 12, 8 had signs of pre-eclampsia and 4 had hypertension.

These 15 patients were investigated by inulin and creatinine clearance, which was combined with a van Slyke urea-clearance test. The urinary output was tested by a modified water-diuresis test. This showed that ante partum there was a reduced urinary flow, compared with the post partum flow under identical conditions. Usually the urea and creatinine clearance figures ran parallel. Occasionally the creatinine clearance exceeded the inulin clearance, although considerable variation in the latter was encountered in patients with pregnancy toxaemia. In severe cases of vascular syndrome associated with oliguria and anuria the usual clearance method cannot be employed, and consequently other methods have to be used. The author recommends the method of Earle and Berliner (Proc. Soc. exp. Biol. N.Y., 1946, 62, 262) of determining the renal blood flow and glomerular filtration without the collection of specimens of urine. This test is based on the fact that inulin or "diodrast" is excreted entirely by the kidney. The method consists in setting up a drip intravenous infusion which delivers a measured amount of solution of known concentration. The clearance rate can be calculated by dividing the amount of the substances injected per minute by their plasma concentrations. The result of these investigations suggests that angiospasm may be responsible for E. M. Darmady the oliguria and anuria.

289. Plasma Angiotonase Concentration in Normal and Toxemic Pregnancies.

By E. W. PAGE. Amer. J. med. Sci., 213, 715-

718, June, 1947. 2 figs., 13 refs.

The usual description of the renal pressor system suggests that angiotonin is formed by the action of renin from the kidney upon a globulin fraction found in the plasma. This angiotonin is destroyed by a group of enzymes collectively named angiotonase. Theoretically, therefore, hypertension can result either from an increase in concentration of renin or renin substrate or from a deficiency of angiotonase. In this investigation estimation of angiotonase was carried out with a view to testing the theory that its deficiency is responsible for the hypertension of eclampsia. Plasma concentration of angiotonase was measured in 10 healthy nonpregnant subjects, 16 women with normal pregnancies, 5 cases of pre-eclampsia, and 5 cases of eclampsia. Angiotonase concentration was much increased in the second part of normal pregnancy, but it rapidly returned to normal after delivery. It was also found that pregnant women with elevated angiotonase levels have a diminished pressor response to injected angiotonin. This suggests that pregnant women, like pregnant rats, are more resistant to hypertension resulting from renal ischaemia. In cases of eclampsia or pre-eclampsia, values of angiotonase activity were found to be low, but not below the level found in the non-pregnant women. The author concludes that there is no correlation, between the degree of hypertension

and the amount of plasma angiotonase, so that deficiency of the protective enzyme angiotonase is an unlikely cause of the hypertension in eclampsia.

E. M. Darmady

290. Quantitative and Qualitative Changes of the Serum Proteins in Normal and Toxemic Pregnancy. The Nature of the Hypoproteinemia in Pregnancy.

By J. Novak and B. Lustig. J. Mt Sinai Hosp.,

14, 534-541, Sept.-Oct., 1947. 49 refs.

The authors investigated the changes in the serum protein in 22 cases of normal pregnancy and 7 cases of toxaemia occurring from the 5th month to term. Of the normal cases, 5 were also investigated between 1 and 7 days after delivery, and 8 cases of normal non-pregnant individuals were

included in the study.

They determined the concentration of the total protein, the albumin and the globulin and also the blood plasma volume and carbohydrate content of the serum proteins. The technique used is described in detail, and those interested should refer to the original article. The concentration of the plasma protein is decreased in normal as well as in toxaemic pregnancy, but the figures show that because of increased plasma volume the total protein content of the circulatory blood is usually higher than in non-pregnant individuals. The average amount of the total serum protein is 225 g. in pregnant and 196 g. in normal non-pregnant women. "Thus the hypoproteinemia in pregnancy means only a dilution of the plasma and not a real lack of As regards the albumin : globulin ratio, there is a significant decrease which is particularly marked in toxaemias. The figures show a decrease in concentration from 4.66 per cent to 3.63 per cent, and in the toxaemic group the albumin concentration drops to 3 per cent. With globulin on the other hand the percentage is slightly higher in normal pregnancy than in the non-pregnant state (2.65 per cent to 2.39 per cent) and is still higher in toxaemic patients (3.38). Thus hypoproteinemia in pregnancy follows the general rule that any decrease in the serum protein is mainly due to a decrease in the albumin fraction which represents the main factor responsible for the regulation of the osmotic pressure of the blood plasma.

In the small number of cases investigated after delivery, the authors found that a hypoproteinemia was still present on the 7th day after

delivery.

Finally they note an alteration in the bound carbohydrate content of the blood proteins in pregnancy: albumin fraction, 1.54 per cent as against 0.89 per cent in the non-pregnant; globulin fraction, 2.61 per cent as against 4.09 per cent in the non-pregnant. In toxaemic patients the bound carbohydrate was higher than in normal pregnant women, both in total protein and in the globulin fraction. The authors discuss various factors relating to hypoproteinemia and they note that the tendency of the pregnant organism to retain salt

and water and to dilute the blood and tissue fluids is apparently the cause of hypoproteinemia, but under normal conditions this is not due to insufficient protein intake. They state that it is probably caused in part by increased function of the adrenal cortex and by the large amount of oestrin and progesterone produced in the maternal organism.

E. L. Nicolson

291. Late Pregnancy Toxemia. I. A Review of Experimental Findings. II. Clinical Trials Based upon Experimental Findings.

By O. W. SMITH and G. V. S. SMITH. West. J. Surg., 55, 288-294, and 313-322, May and June

1947. 10 figs., 34 refs.

Since 1933, when the authors first announced their discovery that the onset of pre-eclamptic toxaemia was preceded by a rise in serum chorionic gonadotrophin and a fall in oestrogens and progesterone, their work has been continued and published in a long series of important papers. In the two papers now under review they summarize this work and state their present conception of the aetiology of the toxaemias of pregnancy. Briefly, this may be stated as follows: The increased chorionic gonadotrophin content of the serum in toxaemia arises from lack of utilization. In normal pregnancy it is utilized in the production of oestrogen and progesterone by the syncytium, this utilization being enhanced by oestrogen oxidation products. In toxaemia the syncytium has undergone premature senile change and is therefore unable to respond to hormonal stimulation. The cause of this premature ageing of the placenta may be diminished vascularity of the uterus which might arise from overdistension, lack of elasticity in the primigravid uterus, or chronic hypertension. At this point the authors make use of the wellknown observations of Markee, who by means of endometrial implants in monkeys' eyes showed that that the immediate cause of menstruation is deprivation of oestrogens, which leads to sudden shrinking of the premenstrual endometrium, with constriction in the spiral arteries of the decidua and of stasis some substance is elaborated which causes constriction in the spinal arteries of the decidua and anoxia of the arterioles and capillaries distal to the point of constriction. When the constriction is relaxed and blood again flows through the injured vessels their walls give way and bleeding takes place into the endometrium and finally into the cavity of the uterus. In pre-eclamptic toxaemia the authors assume a similar sequence of events. Withdrawal of oestrogens leads to tissue damage and formation of an injurious protein similar to menstrual toxin, which, absorbed into the general circulation, causes pre-eclamptic toxaemia, eclampsia, or toxic separation of the placenta. They find that menstrual toxin is present as a protein in the discharge of normally menstruating women and that it is lethal to rats in tiny amounts. They were also able to demonstrate marked toxicity

in the decidua of 3 toxaemic patients, while control tests on decidua from cases of elective Caesarean section were negative. The macroscopical and microscopical pathology in the rats killed by this material was entirely similar to that in rats killed by menstrual toxin, but numerous attempts to extract from the circulating blood of toxaemic women a factor toxic to rats have so far led to inconclusive results. More detailed study of the menstrual toxin led to the finding that it is markedly fibrinolytic, that it causes a febrile reaction in rabbits, and that it is apparently identical with the recently described injury factor found in the pleural exudate of dogs as a part of the inflammatory exudate consequent upon the injection of turpentine. These observations provided more sensitive tests for the presence of menstrual toxin. It was found that the serum of the circulating blood of toxaemic women exhibited all the properties of menstrual toxin except the lethal effect on rats, whereas none of these properties were demonstrable in the serum of normally pregnant women. "The evidence is strong, therefore, that menstrual toxin is present in the circulating blood of pre-eclamptic and eclamptic women, and considering the pathological effects of this injurious protein it is reasonable to assume that the signs and symptoms of this disease are referable to the action of this factor."

In the pseudoglobulin factor of menstrual discharge and of all materials containing toxin and fibrinolytic enzyme so far studied, the authors have found a factor which protects rats against an otherwise lethal dose of menstrual toxin. This they term "protective pseudoglobulin" or "PPs"; from human exudates they have prepared sufficient for clinical trials with the object of neutralizing the toxin. Results obtained in 6 cases are described and it is claimed that definite clinical improvement took place in all-fall in blood pressure and diminution of oedema and albuminuria. It is thought that further purification and concentration of the protective pseudoglobulin, permitting larger amounts to be used, will provide a valuable adjunct in the treatment of toxaemias already established.

In the non-toxic patient diethylstilboestrol should provide an effective protective measure, as it stimulates the secretory activity of the syncytium for production of sex steroids by causing increased utilization of chorionic gonadotrophin, and thus tends to prevent the premature withdrawal of hormonal support. The response to this drug, however, is dependent on absence of the toxin and of the degenerative changes of the prematurely senile placenta.

"As a definitive measure, therefore, diethylstilboestrol alone is of no clinical value. It is worth trying, however, as an adjunct to treatment with PPs, since there is always the possibility that there is still sufficient secretory potential in the syncytium to be stimulated provided the toxin can be

neutralized."

292. Changes in Retinal Arterioles Associated with the Hypertensions of Pregnancy.

By A. V. Hallum. Arch. Ophthal., Chicago, 37,

472-490, Apr. 1947. 2 figs., 48 refs.

The structure of the retinal arterioles is outlined. with details for the benefit of obstetricians of the technique of ophthalmoscopy. The author describes the ophthalmoscopic appearance of arterioles in localized spasm and constricted by sclerosis, and describes three degrees of generalized spasm, classifying retinal arteriolar spasm as follows: (a) venule-arteriole ratio normal (3: 2) with localized spasm; (b) ratio 2: 1 with localized spasms; (c) ratio 3: 1, localized spasms being present but difficult to distinguish; (d) as in (c), or accentuated further, with some retinopathy. The diagnosis of arteriolar spasm superimposed on arteriolar sclerosis is discussed, constriction without increase (or with decrease) in the width of the light reflex indicating angiospasın. Sclerosis is indicated by compression of the veins, asymmetrical constrictions of the lumen, and a marked increase in the light-reflex stripe. A single examination is frequently inadequate, further examination much later being necessary to confirm the diagnosis. The retinopathy is also described and the occurrence of detacliment of the retina (in approximately 2 per cent of cases of hypertensive toxaemia of pregnancy) discussed.

The author quotes figures of his own giving the frequency of various pathological, obstetrical and oplithalmological findings in cases of hypertension during pregnancy, but does not correlate these with the classification of retinal arteriolar spasm which he has described in the earlier part of his paper, although he states that the degree of constriction is usually proportional to the degree of toxaemia.

A review of the literature is given in the paper, ending in the views of Addis that angiospasm produces the hypertension and explains all the signs and symptoms of toxaemia. "It is now generally agreed that acute hypertensive true toxaemia of pregnancy is characterized by localized and generalized spastic constriction of the arterioles, the degree of which has been found to parallel closely the severity of the toxaemia. The degree of spasm of the retinal arterioles indicates the degree of angiospasm in other parts of the body. The eyegrounds should be examined routinely during the early months of pregnancy to determine the status of the arterioles, which will aid in the prognosis of the present pregnancy and will be valuable in interpreting changes that will be seen if toxaemia appears later in pregnancy. When hypertension and other symptoms during late pregnancy indicate toxaemia, the eyegrounds should be examined every few days, with special attention to the degree of angiospasm. When the degree of angiospasm increases in spite of conservative medical treatment, the pregnancy should be terminated nated to prevent permanent damage to the mother's vascular system. In some cases of toxaemia the induction of labour is often a life-saving act for both

mother and baby, and a study of the eyegrounds is probably the most consistently reliable single guide in determining when pregnancy should be terminated. On the other hand, the absence or scarcity of changes in the eyegrounds is often of great help in determining when it is safe to allow pregnancy to proceed."

Sydney Smith

293. Pregnancy following Lumbodorsal Splanchnicectomy for Essential and Malignant Hypertension and Hypertension Associated with Chronic Pyelonephritis.

By J. L. Newell and R. H. SMITHWICK. *New Engl. J. Med.*, **236**, 851-858, June 5, 1947. 2 figs., 8 refs.

The authors report the results obtained by lumbodorsal splanchnicectomy in 14 women, 3 of whom had malignant hypertension and 11 essential hypertension. The operation involves removal of the left and right sympathetic trunks from the ninth dorsal to the first, second, or third lumber segments, together with removal of the great splanchnic nerves from the coeliac ganglia to the mid-thoracic level. In 1 case the operation was performed early in pregnancy, but the authors prefer that at least a year should elapse before pregnancy is permitted. The blood pressure in all fell to a normal or nearly normal level after operation, and with 1 exception has remained so during the 4 or 5 years the patients have been followed up.

In the patient who was 6 weeks pregnant at the time of operation the blood pressure before operation was 180/120 mm. Hg. There was no albuminuria and the ocular fundi were normal, but renal biopsies showed "chronic vascular nephritis, grade 2", After bilateral splanchnicectomy the blood pressure fell to 110/80 mm. Hg. During the remainder of the pregnancy it was 110/70 to 104/90 mm. Hg. There were signs of toxaemia and a living child was born at term. Three months post partum the blood pressure was 120/80 and a month later 102/78 mm. Hg.

The other 13 patients all became pregnant at varying times after operation, and 2 of them twice. In most the blood pressure remained normal throughout the pregnancy, but in a few there was a tendency for it to rise again in the later weeks with or without albuminuria and, in 1, premature separation of the placenta occurred with foetal death. From the 16 pregnancies there were 14 living infants and 2 stillborn, 2 of the infants being delivered prematurely on account of toxaemia.

It is too early yet to assess the final results of this procedure, but it is noteworthy that in 1 case in which there had been an exacerbation of the hypertension with albuminuria during the pregnancy, examination at seven months after delivery showed that the blood pressure was 178/118 mm. Hg. (range 146/110 to 210/164). Before operation it had been 206/130 mm. Hg. (range 164/110 to 220/160), and there were retinal haemorrhages and

papilloedema. At the last examination the ocular fundi "showed marked improvement and were classified as grade 1."

There would seem to be no doubt, however, that the patient at least derives great temporary benefit, and that chronic hypertensives who otherwise would have no chance whatever of producing a living and viable child may be enabled to do so with little or no danger to themselves.

F. J. Browne

294. Puerperal Eclampsia during the War Period of Food Shortage. (L'eclampsia puerperale durante le restrizioni alimentari del periodo bellico.)

By M. TORTORA. Arch. Ostet. Ginec., 52, 228-

233, July-Aug., 1947. 1 fig., 10 refs.

It is the opinion of the majority of authors that the reduction in eclampsia in Germany during the 1914-18 war was due to the shortage of fats and proteins. Wilson stated at the Amsterdam Conference of 1928 that eclampsia was more frequent and severe in Australia where the average consumption of meat was 107.2 kg. per head per year. American authors, however, claim that toxaemias of pregnancy are due not to an excess of protein but to a deficiency of it.

Martinolli and Canna reported a decrease in eclampsia in Italy during the period 1942-45 due

in their opinion to alimentary factors.

The author furnishes statistics, from January 1, 1935, to September 13, 1946, on the cases of eclampsia at the Obstetric Clinic, Naples. The total number of eclamptic women admitted in these years was 384, 236 primiparae (61 per cent) and 148 multiparae (38.54 per cent). In 1940, 67 cases are recorded and a progressive decrease in eclampsia started from that year, the lowest figure being reached in 1944 with 9 cases. The decrease in eclampsia in Naples was not due to the reduced number of deliveries, but to a genuine decrease in incidence of the disease. It was not caused by a change in the proportion of primiparae and multiparae admitted. From 1935 to 1940 inclusive, of a total number of 263 cases of eclampsia 158 were in primiparae (60 per cent) and 105 in multiparae (40 per cent); from 1941 to 1944 inclusive, of 80 eclamptic cases, 53 were in primiparae (66.2 per cent) and 27 in multiparae (33.8 per cent). The lowest incidence of eclampsia was in 1943-44, when animal proteins and meat were almost completely absent. By contrast, in 1945, when the alimentary condition improved, 20 cases of eclampsia are recorded out of a number of deliveries almost the same as in 1944.

Rina Saunders

295. An Investigation of Liver Function in Normal Pregnancy and in the Late Toxaemias of Pregnancy. By E. M. A. DAY and A. L. HELLESTRAND. Med J. Aust., 11, 326-329, Sept. 13, 1947. 15 refs.

The authors describe a series of liver-function tests carried out on patients with toxaemia of late

pregnancy and on a control series of normal pregnant women. Other authors have described results. It has been claimed that the Rosenthal test indicates the degree of toxicity, but this has been doubted and the hippuric acid test has also given inconclusive results.

In the present investigation the cephalin-cholesterol test, the serum phosphatase level, the colloidal gold test and the total serum protein level were studied. One hundred patients with toxaemia gave a smaller number of positive results with the cephalin-cholesterol flocculation test than did 101 women with normal pregnancy. The occurrence of negative results could not be correlated with the severity of the toxaemic condition. No difference could be shown between the levels of acid and alkaline phosphatase in serum in normal pregnant and toxaemic women. The colloidal gold test gave no positive results in 23 toxaemic women, though 2 positive results were obtained in 2 out of 25 normal pregnant women. The level of serum protein was found to be slightly lower in toxacmic women than in normal pregnant women; this agrees with the results of other workers.

Josephine Barnes

296. Late Toxemias of Pregnancy; the Number One Obstetrical Problem of the South.

By R. A. Ross. Amer. J. Obstet. Gynec., 54. 723-730, Nov. 1947.

297. A Case of Severe Pre-eclamptic Toxaemia with Central Placenta Praevia.

By G. Newbold. Brit. med. J., 2, 997-998, Dec. 20, 1947.

298. Pre-eclamptic Toxemia of Pregnancy.

By R. F. Zeigler. North Carolina med. J., 8, 655-659, Oct. 1947. 16 refs.

299. Gastric Symptoms in Impending Eclampsia. (Maagklachten bij dreigende eclampsie.)

By H. Heyster. Ned. Tijdschr. Geneesk., 91. 3622-3624. Dec. 13, 1947.

300. Eclamptic Serous Nephritis. (Nephritis serosa eclamptica.)

By H. DIETEL. Zbl. Gynäk., 69, 514-523, 1947. 3 figs.

301. Post-eclamptic Epilepsy. (Epilepsia posteclamptica.)

By C. Pinedo and N. Quirno. Rev. Asoc. méd. argent., 61, 715-716, Oct. 15-30, 1947. 4 refs.

302. Infarction of the Uterus. (Uterusinfarct.) By A. J. M. HOLMER. Ned. Tijdschr. Geneesk., 91, 3590–3594, Dec. 13, 1947.

303. Clinical and Critical Contribution to the Treatment of Placenta Praevia. (Contributo casistico e critico alla terapia della placenta previa.)

By A. Rizzuti. Arch Ostet. Ginec., 42, 95-109, Mar.-Apr. 1947. 32 refs.

In an extensive review of the literature on placenta praevia a table, compiled from 27 authors, is included in which statistics of maternal and foetal mortality are arranged according to the mode of delivery—whether abdominal or vaginal. It is interesting to note that, in the majority, both maternal and foetal mortality are lower when the abdominal route is employed.

The author presents results in 87 cases collected over a period of 17 years. These form 1.1 per cent of the 7,288 deliveries which took place during this period at the Obstetrical and Gynaecological Clinic of the University of Siena. Of these patients, 20 (22.9 per cent) were primiparae, 23 (26.4 per cent) secundiparae, and 44 (50.5 per cent) multiparae. The insertion of the placenta was lateral in 27 (31 per cent), marginal in 32 (36.7 per cent), and central in 28 (32.1 per cent). There were 4 pairs of twins, so that 91 infants resulted. Of these, 21 (23 per cent) were delivered spontaneously, 50 (54.9 per cent) after vaginal intervention, and 20 (21.9 per cent) by Caesarean section. A detailed analysis of the cases is given according to the method of treatment adopted. The over-all results showed a maternal mortality of 8 per cent with vaginal intervention, and of 10 per cent with abdominal delivery.

In discussing his results further and comparing them with those of other authorities the author concludes that no standard treatment can be laid down for cases of placenta praevia but that each case

must be treated on its own merits.

[There are several weaknesses in this article. First the series is far too small for any appraisement of the true merits of the methods of treatment employed. Secondly, the author does not state how he arrived at the diagnosis of placenta praevia, nor is there any statement regarding the severity of the haemorrhage or the numbers of haemorrhages which occurred. He does not indicate whether blood transfusion was employed.]

Josephine Barnes

304. The Incidence of Placenta Praevia and Antepartum Haemorrhage according to Maternal Age and Parity.

By H. Kalmus. Ann. Eugen., Camb., 13, 283-

290, June 1947. 3 figs., 5 refs.

The author successfully employs the statistical method, as Penrose did before him, to show that central placenta praevia exhibits a strong correlation with maternal age. Details of maternal age, parity, and type of all classes of placenta praevia and of all haemorrhages at birth occurring between 1927 and 1945 were studied, together with a control series of 1,056 records of deliveries chosen at random during the same period and in the same hospital. Central placenta praevia was found to be predominantly related to maternal age, and non-central placenta praevia and antepartum haemorrhage to be mostly related to parity. It follows from this that the causal mechanisms concerned in the production of central placenta praevia on the one hand, and non-central placenta praevia and antepartum haemorrhage on the other, differ with regard to maternal age and parity; these differences are shown to be of value in diagnosis. For a primipara known to have a placenta praevia the probability that it is a central one rises from 12 per cent at 15 to 19 years to 72 per cent at ages 45 to 50, at which late age placenta praevia centralis is progressively less likely to occur in multiparae. The chances that any severe bleeding at childbirth is due to central placenta praevia are considerable in very elderly primiparae and in second preguancies, whereas they become very small with decreasing maternal age and increasing parity.

The author discusses the possibility of a genetical aetiology and a maternal-foetal incompatibility as causal agencies of these conditions, but it is difficult to imagine a way in which, at such an early stage, serological causes could prevent implantation of an

ovum at the usual place in the fundus.

F. A. E. Crew

305. Treatment of Placenta Praevia: Some Historical and Modern Aspects.

By J. E. SAVAGE. Bull. Sch. Med. Maryland, 32, 97-110, Oct. 1947. 44 refs.

306. Chorio-angioma of the Placenta. (Corio-angioma da placenta.)

By D. Delascio and C. Ciari. Rev. Ginec. Obstet., 2, 733-758, Oct. 1947. 4 figs. Bibliography.

307. Use of Sodium  $\beta$ -Glycerophosphate in Obstetrics. (El empleo del  $\beta$ -glicerofosfato sodico en la clinica obstetrica.)

By J. Botella Llusia and C. Garcia Funcasta. Obstet. Ginec. lat.-amer., 4, 896-911, Dec. 31, 1946.

5 figs., 10 refs.

The authors report an extensive obstetrical experience of sodium  $\beta$ -glycerophosphate. The practical application of this drug is founded on the work of Velázquez and his school, who found that glycerophosphate has a paralysing effect on the nterus, while lacking the effect on the intestines and blood vessels possessed by glycerin. The  $\beta$ -isomer is more effective than the  $\alpha$ -isomer. Its action is still imperfectly understood, but is supposed to be due to the effect of the phosphorus-bearing radical on uterine metabolism.

In 61 cases of threatened abortion this drug failed to avert abortion in 10 cases, and in another 3 abortion was postponed. Its action is purely a symptomatic one in inhibiting uterine activity. It was successful in 6 cases out of 10 of premature labour, and was temporarily successful in some of the others. In 8 cases in which laparotomy was carried out during pregnancy the drug was successful in preventing abortion in all. The authors have now used the drug in a total of 129 patients with excessive uterine action in labour, including such conditions as rigid cervix, tetanic

spasm, and violent action following pituitrin administration. In 24 cases the drug failed, but in 18 of these there was some explanation for failure, such as inadequate dosage or a history of polyneuritis of pregnancy. In cases of placental retention the drug has also been successful, and in such cases the uterus will subsequently react to oxytocic drugs. For the treatment of after-pains the drug has been used in over 200 cases, with failure in approximately 10 per cent.

The dose has varied between 10 ml. of 50 per cent solution once or twice daily in cases of threatened abortion or premature labour, and 30 ml. in cases of threatened rupture of the uterus or violent tetanic system. [The route of injection is not stated in this article, but in previous reports it appears to have been the intravenous one.] No toxic effects were observed when daily amounts of up to 10 or 15 g. were given. Failure has usually been observed in cases of polyneuritis of pregnancy, and it is believed that aneurin is necessary for the action of the glycerophosphate on the uterine

effect on the foetal respiratory centre.
[The introduction of this drug should constitute a big obstetrical advance, if the enthusiastic Spanish

muscle. No harmful effect on the foetus has been noted, and in some cases with excessive uterine

action the heart sounds have become stronger

after its use. It is also believed to have a stimulant

reports about it are confirmed.]

Bryan Williams

308. A Rare Cause of Intrauterine Death. (Een zeldzame doodsorzaak van het kind in utero.)

By H. Hoyng. Ned. Tijdschr. Geneesk., 91,

1977-1983, July 19, 1947. 5 figs., 7 refs.

A 30-year old normal healthy multipara noticed towards the end of her fourth pregnancy that the foetus, after a day of unusually violent intrauterine movements, ceased to give signs of life. On examination it was found that the foetus was dead; no maternal or foetal cause could be detected. Spalding's sign was absent. Labour, induced artificially, produced a macerated child weighing 3.3 kg., and the placenta was expelled 10 minutes later. Its appearance and that of the chorion were normal, but the amnion was detached and rolled into a thin strand; at a distance of 35 mm. from the insertion it was wound tightly round the umbilical cord, causing constriction. On both sides of the strangulation the cord was swollen and oedematous. The author has found no record of a similar case in the literature.

A. Lilker

309. Oliguria after Abortion.

By J. H. Humphrey and F. A. Jones. Clin. Sci., 6, 173-186, July 17, 1947. 5 figs., 27 refs.

Renal failure with oliguria after abortion (of which only 19 cases have been hitherto reported) may be due to pyelonephritis, ingested poisons, sulphonamides, quinine sensitivity, incompatible

transfusion, a syndrome described by Bratton with renal changes resembling those of crush syndrome, or symmetrical cortical necrosis. Four patients, all of whom recovered with "conservative" treatment, are described in the fullest detail. These were seen over a period of 20 months in a hospital where 400 abortions are dealt with annually. Careful control was kept of salt and water balance; glucose, bicarbonate, aneurin, nicotinic acid, ascorbic acid, penicillin, and blood transfusions were also given. Biochemical observations included studies of plasma electrolytes and indicators of endogenous tissue breakdown, such as sulphate, urea, uric acid, phosphorus, and potassium. Deductions are made therefrom on the general metabolism in uraemia, such as that 57 to 67 g. of protein is broken down daily. Creatinine clearance is taken as an index of glomerular filtration, and it is assumed that the true serum creatinine is two-thirds of the apparent value. In I case the volume of filtrate corresponded to the total volume of urine. Pigment casts were found in the urine in 2 cases. Urea clearance returned towards normal: a puzzling point in Case I was the failure to concentrate "diodrast" 2 years afterwards, with normal blood urea and urea clearance and without nycturia. The pathogenesis of this syndrome is discussed in the light of the work of Barclay, Trueta, Daniel, Franklin, and Prichard (Lancet, 1946, 2, 237). The pathological process involved was thought to be renal vessel spasm with or without thrombosis, such as is found in persons dying with symmetrical renal cortical necrosis.

[Positive evidence for the above theory is inconclusive; negative evidence by exclusion of other possibilities is not complete. For example, intravascular haemolysis due to forceful injection of soap and water is a possibility in some cases, similar to the pigment nephrosis following water-flushing

in prostatectomy.

E. G. L. Bywaters

310. Sulphathiazole Treatment of Infected Abortion. (Sulfatiazolbehandling av infekterade aborter.)

By R. FAHRÆUS. Nord. Med., 35, 1641-1644,

Aug. 1, 1947. 13 refs.

Treatment of infected cases of abortion at the Sabbatsberg Hospital, Stockholm, with sulphathiazole has now been stopped because a careful study of two series of cases—284 treated with 6 g. of the drug daily and 148 control cases—revealed no significant difference in duration of fever, stay in hospital, or incidence of complications. Where septicaemia or peritonitis complicated the abortion sulphathiazole treatment seemed of no value.

S. S. B. Gilder

311. The Treatment of Inevitable, Incomplete, and Septic Abortion. An Analysis of 600 Consecutive Cases.

By J. McD. Corston and J. STALLWORTHY. Brit. med. J., 2, 89-91, July 19, 1947. 4 refs. The authors' purpose is to consider the treatment

of inevitable, incomplete, and septic abortion. The abortion was regarded as: (a) Inevitable, when bleeding was associated with uterine contractions and dilatation of the internal ostium. (b) Incomplete, when bleeding persisted after abortion and examination revealed a bulky uterus, usually with a patulous cervical canal, or when inspection of the aborted material indicated surely that tissue had been retained. Subsequent removal or passage of placental fragments confirmed the diagnosis. (c) Septic, when associated with otherwise unexplained pyrexia, offensive or purulent discharge, or evidence of pelvic inflammation.

There are two main schools of thought in the tréatment of established abortion. (a) The "non-interventionists" believe that, given time, the interus will empty itself; they maintain that the mother is thereby subjected to the least possible risk. (b) The "interventionists" consider that all inevitable and incomplete abortions which are not rapidly and spontaneously completed should be treated by surgical evacuation of the uterus. The authors declare themselves "interventionists" but consider this practice at least as safe as that of "non-intervention". General surgeons have long accepted that a wound heals most rapidly when cleansed of non-viable debris. The wound at the placental site should be treated similarly.

The series supporting these contentions consists of 600 consecutive cases of inevitable, incomplete, and septic abortion. The authors have not included 58 cases of threatened, spontaneous complete, and missed abortions-in this group there were no fatal cases. The serious nature of many of the 600 cases is shown by the fact that 71 required blood transfusion. The method of evacuation employed is described in detail. The operation completed, a pack of sterile gauze (impregnated in septic cases with 10 g. of sulphathiazole powder) is inserted into the uterine cavity. It is removed in 6 hours. The patient gets up 36 to 48 hours after the evacuation and is discharged on the third or fourth day. There was I death in the series (mortality of 0.17 per cent). This patient had aborted I month previously and bled daily until she was admitted with a haemoglobin value of 22 per cent. A provisional clinical diagnosis of gas-gangrene infection was confirmed by a necropsy finding of Clostridium welchii septicaemia.

Anthony W. Purdie

312. Treatment of Clostridium welchii Septicaemia after Abortion. (Traitement des septicémies postabortum à bacillus perfringens.)

By P. A. RICHARD. Sem. hop., Paris, 23, 2865-

2868, Dec. 21, 1947. 2 figs.

313. The Legal Basis for Lawful Abortion in South

By N. C. Masters. Clin. Proc. Cape Town, 6, 300-305, Sept. 1947. 17 refs,

314. The Diagnosis of Hydatidiform Mole by Gonadotropic Hormone Assay Using the South African Frog. (Xenopus Lævis.)

By A. I. Weisman and C. W. Coates. *J. clin. Endocrinol.*, 7, 289–292, Apr. 1947. 13 refs.

The differential diagnosis of pregnancy and chorionepithelioma or hydatidiform mole may be made by injecting Xenopus frogs with neat or diluted urine. Two female frogs are each injected with 1 ml. of neat urine, or of urine diluted tenfold or a hundredfold. If ovulation is produced by the neat urine only, then the case is one of pregnancy. If the smaller dilution produces ovulation this is strong evidence of chorionepithelioma or hydatidiform mole; conclusive evidence of one of these is given if the larger dilution also produces ovulation. Correct diagnoses were thus made in 31 cases.

P. C. Williams

315. Carcinoma of the Cervix and Pregnancy. (Cáncer del cuello uterino y embarazo.)

By C. Zuckermann. Obstet. Ginec. lat.-amer., 5, 343-346, Aug. 1947. 11ef.

316. The Treatment of Carcinoma of the Cervix Complicated by Pregnancy.

By G. G. WARD. J. Mt Sinai Hosp., 14, 674-678. Sept.-Oct. 1947. 11 refs.

317. Carcinoma of the Uterus and Pregnancy. (Uteruskarzinom und Gravidität.)

By I. M. STUTZER. Strahlentherapic, 76, 361-

370. 1947. 4 figs., 50 refs.

Twenty-three cases of carcinoma of the cervix were associated with pregnancy in a series of 20,575 deliveries during a 20-year period of observation. In the same period 3,482 genital carcinomata were treated, of which 2,250 were uterine. Seventeen of the cases were diagnosed and treated during pregnancy, 6 after delivery. The average age of the patients was 33 years (22-42), ten years less than the average in the non-pregnant. The average parity was 5.

The author stresses the facts that the earliest symptom, haemorrhage, does not indicate the beginning of the carcinomatous process, and that an extensive carcinoma in pregnancy may be entirely symptomless. Furthermore, severe bleeding or its occurrence early in pregnancy does not necessarily imply an extensive or inoperable growth. As a rule the bleeding was not alarming nor was the stage of the growth correlated with the occurrence of the bleeding or the duration of pregnancy. Only one Stage III carcinoma was encountered during pregnancy. There appeared to be no rule by which the prognosis or rapidity of growth of the carcinoma in pregnancy could be determined, and while younger patients tended to have the least favourable outlook (about that of Stage III cases treated by radium therapy) in one such case pregnancy appeared to have an actual retarding effect on an established carcinoma. Rapid growth occurs. however, in the puerperium and immediate operation is therefore advised.

The treatment advised is neatly tabulated, according to the stage of pregnancy when the carcinoma is discovered and its operability, thus:
(a) First 3 months—Wertheim operation and irradiation or, if inoperable, supravaginal amputation followed by radium and irradiation. (b) Last 3 months—Caesarean section followed by Wertheim operation and irradiation. (c) In the puerperium—immediate operation. (d) Where a living child is urgently desired—radium (2×2,000 mgm.-hrs.) and then as under (b).

An operability rate of 94.1 per cent was obtained with a primary mortality of 2.5 per cent and a 5-year cure rate of 42 per cent. In each case X-ray therapy was also given postoperatively.

E. D. Grasby

318. A Case of Uterine Sarcoma in Pregnancy. (Uber einem Fall von Uterussarkom in der Gravidität.)

By I. M. STUTZER. *Zbl. Gynäk.*, **69**, 350–353, 1947. 3 figs., 20 refs.

319. On the Problem of Uterine Malformation in Pregnancy and Labour. [In English.]

By A. Sadovsky and A. Brzezinsky. Acta med. orient., Tel-Aviv, 11, 277-281, Sept. 1947. 1 fig., 7 refs.

320. Full-term Pregnancy Following Operation for Atresia of the Vagina.

By J. L. BAER. J. Mt Sinai Hosp., 14, 244-247, Sept.-Oct. 1947. 2 figs., 3 refs.

321. Full-term Pregnancy following Operation for Congenital Absence of Vagina.

By J. L. BAER and E. J. DECOSTA. Amer. J. Obstet. Gynec., 54, 696-697, Oct. 1947. 4 refs.

322. Heus in Pregnancy. (Ileus in der Schwangerschaft.)

By H. Dorr. Med. Klinik., 42, 761-762, Oct. 15, 1947. 5 refs.

323. The Effect of Pregnancy on the Incidence of Dental Caries in Indian Women.

By C. D. M. DAY and K. L. SHOURIE. *Indian J.* med: Res., 35, 101-108, Apr. 1947. 20 refs.

The teeth of 182 women were carefully examined. The degree and severity of caries found in all the teeth and in the lower left first molars were analyzed in respect of the number of pregnaucies in different age groups. No correlation was found to exist, and the findings, therefore, do not support the popular view that pregnancy tends to produce an increase in dental caries.

John Yudkin

324. Treatment of Pyrosis in Pregnancy by Prostigmin. (Tratamiento de la pirosis del embarazo por prostigmine.)

By J. J. Gomez-Sigler. Toko-ginec. práct., 6, 125-127, Apr. 1947.

A series of 137 cases of severe pyrosis of pregnancy, treated with prostigmin after full investigation, is reported. Test-meals in all cases showed that in 18 the acidity was normal, in 16 there was hyperchlorhydria and 78 hypochlorhydria, and in 25 there was almost complete achylia. X-ray examination showed that an opaque meal passed normally through the oesophagus in 79 patients, but in the 58 others filling was slow and motility was decreased. One case had a diaphragmatic hernia and saccular dilatation of the cardiac end of the stomach. In no case was an organic lesion found in the stomach or duodenum, but in 92 cases there was delayed emptying with decreased tone, in 19 cases rapid emptying with increased tone, and in the other 26 peristalsis was normal.

Treatment was carried out with twice-weekly intramuscular injections of prostigmin, 0.5 to 1 mg. In some cases hydrochloric acid and gastric ferments were also given, and in severe cases daily intravenous injections of 100 mg. of aneurin. In 102 cases there was complete relief of symptoms, in 23 cases marked relief, and in 12 only temporary relief or none at all. Improvement usually followed the first or second injection, and 6 was the maximum number found necessary. The drug had no harmful effect on the uterus, and there were no cases of abortion.

The author considers that in this condition there is decreased tone in the oesophagus and intestinal tract produced by the hormones of early pregnancy, and that prostigmin acts by stimulating the parasympathetic system and inhibiting the action of cholinesterase, thus bringing about normal motor and secretory function.

Bryan Williams

325. Heart Disease and Pregnancy.

By J. Barnes. *Med. Press*, 443-446, Nov. 12, 1947. 6 refs.

326. Pregnancy and Coronary Insufficiency. (Schwangerschaft und "Coronarinsuffizienz.")

By H. Siedek and R. Wenger. Wien. klin. Wschr., 59, 696-700, Oct. 24, 1947. 2 figs., 62 refs.

327. Auricular Fibrillation in Pregnancy and Labour. (Boezemfibrilleren in zwangerschap en kraambed.)

By G. A. LINDEBOOM. Ned. Tijdschr. Geneesk., 91, 3686-3695, Dec. 20, 1947. 9 refs.

328. Thrombosis and Embolism in Pregnancy (Thrombose und Embolie in der Graviditat.)

By R. AESCHBACHER. *Praxis*, 36, 879-882, Dec-27, 1947. 29 refs.

329. Icterus Gravis in Pregnancy and Spontaneous Symmetrical Fractures (Milkman's Syndrome). (Icterus gravis graviditatis et fractures symétriques spontanées—syndrome de Milkman.)

By D. STUCKI. Schweiz. med. Wschr., 77, 398-

404, Apr. 5, 1947. 3 figs., 20 refs.

A case of icterus gravis is described in a primipara of 39 who had complained of increasing pain in the

back during the later months of pregnancy. X-ray examination on admission to the clinic (as a case of toxaemia) revealed symmetrical spontaneous fractures in the right and left tenth ribs (Looser's zones of reconstruction). Coma developed but a living child was born and the patient recovered. Intramuscular injection of 600,000 units of vitamin D with three tablets daily of "calcium-Dredoxon" and "C-phos" produced a considerable improvement in the bony lesions after 15 days.

The author discusses the relative parts played by hypovitaminosis D, hepatic and endocrine dysfunction, and the demands of the foetus in producing the bony lesions. He attributes their location in the tenth ribs to the mechanical factors of pregnancy, when the centre of gravity of the body is displaced forward, altering the muscular tension of the diaphragm and the muscles of the back. He emphasizes the value of serum phosphatase estimations; a secondary rise indicated the advisability of a second intramuscular injection of vitamin D.

E. T. Ruston

330. Leukemia (Summary of 100 Cases) and Lymphosarcoma Complicated by Pregnancy. Cellular Changes Produced in Guinea Pigs by Extracts of "Leukemic" Placenta.

By L. A. Erf. Amer. J. clin. Path., 17, 268-280,

Apr. 1947. 2 figs., 57 refs.

The course of leukaemia is not altered by pregnancy. Fowler's solution, transfusions, and brewer's yeast are still probably the best therapeutic agents in leukaemia complicated by pregnancy. X-radiation directed even close to the abdomen is probably dangerous to the foetus. The placenta from a patient with chronic myeloid leukaemia showed slight infiltration with myeloid cells. A lipid extract of this placenta, injected into 2 guineapigs, produced myeloid cell infiltrations in the organs, while injection of a similar extract of a normal placenta produced no abnormal cellular infiltrations in the organs of 2 control animals.

The placenta is a complete barrier to leukaemia, whether the leukaemia is in the mother or in the

foetus.—[Author's conclusions.]

33r. Sickle Cell Anemia and Pregnancy.

By J. H. Hodges and J. B. Bernstine. Amer. J. Obstet. Gynec., 54, 108-113, July 1947. 21 refs.

Three case reports of sickle-cell anaemia in pregnancy are added to the 20 published cases. Two of these patients presented signs and symptoms of toxaemia of pregnancy. In sickle-cell anaemia with pregnancy, vascular phenomena, particularly thromboses, occur frequently. These phenomena may, in these instances, bear an important relationship to the occurrence of, or the severity of, the symptoms of the toxaemia of pregnancy.—[Authors' summary.]

332. Sickle Cell Anemia in Pregnancy. By J. CARANGELO and O. M. OTTS. Sth. med. J., 40, 1016-1019, Dec. 1947. 9 refs. 333. Pernicious Anaemia in Pregnancy. (Zur Kenntnis der Schwangerschaftsperniziosa.)

By A. Scharplatz, Zbl. Gynäk., 69, 135-141, 1947. I fig., 11 refs.

334. Shock Therapy during Pregnancy.

By E. M. KENT. *Psychiat. Quart.*, 21, 102-106, Jan. 1947. 5 refs.

Pregnancy has been regarded by many as a contra-indication to shock therapy, though patients have been described in the literature in whom this form of therapy did not interrupt the normal course of pregnancy. Three psychotic women were treated in Gowanda State Homoeopathic Hospital. The first, a Jewish multipara, had a paranoid schizophrenia. A third course of shock therapy combined with insulin treatment without rest in bed was given during pregnancy, though the latter was not diagnosed with certainty at the time and abortion

ensued at four months.

The second patient was a Polish woman, five months pregnant with her second child, who developed a manic-depressive psychosis for which she was given electro-shock treatment with fair results, the child being delivered alive by Caesarcan section. The third patient, an American woman four months pregnant with her first child, became severely ill with schizophrenia. She was given electro-shock therapy and deep insulin therapy with some benefit, and was delivered of a living child at term.

It is clear that pregnancy is not a complete contra-indication to shock therapy, though the latter is not unattended with risk. Whether the treatment is more of a risk than the manifestations of the psychosis is open to doubt. Not enough is known to indicate whether any particular stage of pregnancy is more favourable for this treatment or whether any length or severity of treatment constitutes an added risk. Each case must be treated on its merits.

R. G. Gordon

335. Status Epilepticus Complicating Pregnancy. By J. F. Goodwin and C. W. Lawson. Brit. med. J., 2, 332-333, Aug. 30, 1947. 5 refs.

The case is described of a married woman of 23 who was admitted to hospital in status epilepticus when she was three months pregnant. She began to have major epileptic fits at the age of 21 and thereafter continued to have occasional fits which were controlled by phenobarbitone. After one year's treatment she ceased to take the drug, with the result that she went into status epilepticus for a few hours eighteen months before her admission to hospital. During the first three months of her pregnancy she again ceased taking phenobarbitone. The pregnancy remained undisturbed in spite of the fact that she was in continuous coma for six days and had a total of 128 fits in hospital in addition to an unknown number before admission. The treatment consisted of repeated intramuscular injections of sodium .phenobarbitone and of intravenous injections of thiopentone, together with paraldehyde first by the rectum and later through a gastric tube. She was finally delivered of a normal child at term.

The attack of status epilepticus was considered to be due to two factors: (1) failure to take the prescribed dose of phenobarbitone, and (2) the effects of the changes in normal balance with intracellular fluid retention which occur in pregnancy and which may lead to a slight degree of cerebral oedema sufficient to "fire-off" an excitable cortical focus.

Geoffrey McComas

336. The Treatment of Tetany in Pregnancy and after Delivery. (Lécha tetanie v tehotenství a po porodu.)

By V. Sebek. Ceskoslov. Gynaek., 12, 222-241,

1947. 6 refs.

The author had never seen a case of tetany of pregnancy or lactation in the 14 years before 1940, but has encountered several cases since. Probably deficient nutrition, overwork, and the psychological strain of the German occupation are responsible. He finds that nowadays tetany is rarely seen in its acute and severe form, but mostly as a chronic disease of varying intensity, with a good prognosis as to life; the outlook for complete cure, however, remains dark. Hypocalcaemia may be absent even in the most obvious cases, and the determination of ionized calcium and of inorganic phosphorus is of great importance in diagnosis.

Seven cases are described, 1 of them in detail. A woman, 5 months pregnant, had been suffering for 3 years from recurrent tetanic convulsions, which were aggravated by the present pregnancy. Reluctant to terminate the pregnancy, the author implanted calcium tablets (5 g.) subcutaneously; this, together with regular administration of parathyroid hormone, led to some improvement for 40 days, but a severe relapse followed. However, the pregnancy continued, and at term the patient was delivered of a healthy boy. Immediately after delivery the spasms disappeared almost completely, but a month later a relapse refractory to all treatment ensued, although she did not breast-feed her infant. When mental changes appeared it was decided to implant four parathyroid glands from freshly killed bullocks into the rectus sheath, no human parathyroids being available. This was followed by immediate and complete disappearance of all signs and symptoms for 6 months. Re-implantation had a similar effect for 9 months, when the patient had signs of an impending relapse, and was found to be 3 months pregnant. Since she refused further implantations and showed herself non-co-operative with regard to avoidance of pregnancies, termination of pregnancy with sterilization was performed. Six more cases are briefly described; in 4, implantation of bullock parathyroids was performed with very good results while the condition in the other 2 could be controlled by the usual means. Implantation had to be resorted

to because "AT io" was unobtainable during the war. With equally good results, implantations were performed in a few cases of tetany unconnected with pregnancy,

A. Rohan

337. Polycystic Kidney Disease in Pregnancy. By P. Findley. J. Mt Sinai Hosp., 14, 293-295, Sept.-Oct., 1947.

338. Nephropathies of Pregnancy and their Influence on the General Health and Genital Functions.

By T. I. Orlova. Akush. Ginek., 5, 49-53, 1947.

339. Propylthiouracil in Pregnancy. Report of a Case.

By L. Bain. Sth. med. J., 40, 1020-1021, Dec. 1947. 3 refs.

340. Hodgkin's Disease and Pregnancy. (Lymphogranulomatose and Schwangerschaft.)

By I. F. Nikischin. Geburtsh. n. Frauenheilk., 7, 110-115, Nov., 1947. 10 refs.

341. Pregnancy Associated with Diabetes.

By L. M. RANDALL. Amer. J. Obstet. Gynec., 54, 618-625, Oct. 1947. 3 refs.

342. Diabetes and Pregnancy.

By W. E. HENLEY. N. Z. med. J., 46, 386-397, Oct. 1947. 2 figs., 59 refs.

343. Diabetes Mellitus and Pregnancy. (Diabetes Mellitus og Graviditet.)

By K. E. Petersen. Ugeskr. Lag., 109, 913-918, Dec. 11, 1947. 1 fig., 13 refs.

344. Infectious Hepatitis associated with Pregnancy. A Report of four Cases.

By R. Martin and F. C. Ferguson. New. Engl. J. Med., 237, 114-117, July 24, 1947. 7 refs.

On account of the rarity of this combination the authors have recorded 4 cases of infective hepatitis in pregnant women during an epidemic which occurred in Portland, Maine, starting in 1944. All the patients were multiparae, three aged 24 to 26 years and the fourth 39. Symptoms of liver damage appeared in mid-pregnancy in 3 cases, and 31 days after a miscarriage in the fourth (this can be included because the incubation period is said to vary from 20 to 40 days). The usual symptoms are described; fever with rigors was present in 2 of the cases. Laboratory tests showed definite evidence of liver dysfunction, and the patients were all anaemic (red cell count about 3,500,000 per c.mm.). Treatment consisted of a diet rich in protein, carbohydrate, and vitamins, with little fat—although owing to anorexia this was not relished—supplemented with infusions of 1,000 ml. of 10 per cent glucose in distilled water and casein hydrolysate (in the form of "amigen" solution, 1,000 ml.) given intravenously each day. Vitamin B was supplied intramuscularly and as brewer's yeast, together with crude liver extract. On this diet patients improved steadily, although 1 required Caesarean section after 2 months, the baby dying 7 days later. In addition the authors recommend the use of --globulin, although this therapy is of no apparent use once the symptoms have appeared. The main emphasis is laid upon prompt admission to hospital and rest in bed, for the duration of jaundice has been found to be inversely proportional to the amount of strict rest in bed instituted at the beginning of treatment,

None of the mothers died, and the deaths of 2 of the children could be attributed only to prematurity, since there was no sign of liver damage in either. Permanent liver damage may have occurred in 1 of the adults, for when last seen she had a raised erythrocyte sedimentation rate and an abnormal blood protein level, but seems unlikely in the other 3. The patient appears to benefit from removal of the foctus, and in cases which do not respond to treatment interruption of the pregnancy should be seriously considered.

T. E. C. Early

345. Infectious Hepatitis in Pregnancy.

By B. Zondek and Y. M. Bromburg. J. Mt. Sinai Hosp., 14, 222-243, Sept.-Oct. 1947. 41 refs.

346. Cause of Congenital Defects Following Rubella in Mother; Role of Adrenals.

By E. E. Brown. Northw. Med., 46, 288-294.

Apr. 1947. 2 figs., 121 refs.

This short but important paper quotes no fewer than 121 references in support of the view that the congenital defects resulting from rubella in the mother during early pregnancy are caused mainly by the attack of the virus on the embryonic adrenal cortex. So important is the function of the foetal adrenal cortex in controlling the growth of brain, heart, and ectodermal and mesodermal tissues generally, that maldevelopment of these tissues can be accounted for completely by lesion of the adrenal cortex. It is unnecessary to postulate direct viral damage to the individual structures, except in the case of opacities of the lens, cornea, and vitreous body, which may be produced by a direct effect.

While the most common congenital defects of the infant attributed to rubella in the mother are congenital heart disease, cataract, and deafmutism, many other defects have been reported. These include: (1) ocular anomalies—buphthalmos, pigmentation of the retina, strabismus, microphthalmia, nystagmus, dacryostenosis, foetal iritis, and foetal uveitis; (2) cerebral anomalies-microcephaly, cerebral agenesis; (3) general defectscleft palate, umbilical and inguinal hernia, hypospadias, cryptorchidism, talipes equino-varus, spina bifida occulta, hydrocephalus, and mongolism; (4) persistent thymus; (5) clinical phenomena—sucking and feeding difficulties, malnutrition and physical development, prematurity, retarded asthenia, cyanosis, retarded eruption of teeth, marked sensitivity to atropine, susceptibility to

respiratory disease, purpura, severe anaemia,

pyloric stenosis, and mental deficiency.

Normal physical and cerebral development *m* utero seems to be dependent on an intact adrenal cortex. Hypoplasia or complete absence of the adrenals is the usual finding in stillbirths due to anencephaly and other monstrosities. The possible importance of adrenal function in the foetus is suggested by the size of these glands in foetal life. In the 3-month foetus they are approximately as large as the kidneys. The degree of cerebral defect in infants, varying from anencephaly to idiocy or mental retardation, seems to depend on the degree of adrenal deficiency.

Cataract may be produced either by insufficient adrenal cortical control or, more probably, by a direct effect of rubella virus on the lens anlage, which is vulnerable during its critical period of development between the fifth and ninth weeks of foetal life. Microphthalmia, congenital glaucoma (buphthalmos), and dacryostenosis are pure developmental defects most probably associated with deficient growth of the structures or with lack of vascular tone and consequent disturbed secretion. All these conditions could, however, arise from hypoadrenia. Pigmented spots on the fundus have probably a similar origin.

Cardiac defects include delay in closure of the interventricular septum, ductus arteriosus, and foramen ovale. The critical period for their development is from the fifth to the eighth week, and they have been related by various observers to an associated adrenal hypoplasia. Heart anomalies as well as eye defects, enlarged thymus, small brain, hernia, cleft palate and hypospadias are not uncommon in mongolism, 2 cases of which occurred in a series of 45 infants whose mothers had had

rubella.

The association of congenital hydrocephalus with hypoplastic adrenals and the antagonism and inter-relationship between the adrenals thymus have been clearly established. The conditions most indicative of cortical hypoadrenia in the infants under consideration are retinal pigmentation, anorexia, asthenia, susceptibility to infection, and persistence of thymus, while suggestive conditions are arrested development, prematurity and immaturity, pyloric stenosis, glaucoma, and mongolism. In mongolism there is impairment of the adrenal cortex. H. Stanley Banks

347. Tuberculin Skin Reactions in Pregnancy and the Puerperium. (Cutiréaction tuberculinique et état gravidopuerpéral.)

By M. Rivière, L. Chastrusse, and —. Fontanaud. Rev. franç. Gynéc. Obstét., 42, 175-182,

May 1947. 1 fig., 4 refs.

The authors examined the cutaneous reaction of pregnant women to tuberculin in an attempt to determine whether women are more liable to tuberculosis during pregnancy than at other times. They discuss the difficulty of providing adequate

controls, and present previous observations showing enormous variation in the proportion of tuberculin-positive reactions due to the selection of material. With tuberculin in a concentration of I in 10,000 they obtained 60 per cent of positive reactions in pregnant women compared with 75 per cent in non-pregnant controls, and with a concentration of I in 5,000, 52 per cent of positive reactions compared with 68 per cent; they suggest. that the fall in the proportion of positive reactions in pregnancy indicates an increase in antibodies. Nevertheless, they conclude that no general theory regarding changes in antibody values is possible from their investigations. In women with old tuberculous lesions they had 100 per cent of positive reactions. In women with doubtful old tuberculous lesions the percentage was only slightly higher than that of a group of students used as controls.

[This work offers interesting speculations on the rise in levels of antibodies which mothers subsequently transmit to their infants. The fact is well recognized, but the authors offer no experimental observations on this point. The conception of this study is unsatisfactory, since it is obvious that no proper conclusions could be drawn in the absence of adequate controls.]

Bernard Sandler

348. The Effect of Diphtheria on Pregnancy, with a Report of Five Cases.

By D. ROBINSON, P. HARDY, and L. M. HELL-MAN. Amer. J. Obstet. Gynec., 53, 1029-1035, June 1947. 30 refs.

Diphtheria in pregnancy and the puerperium is rare; only 5 cases were observed in over 50,000 deliveries during 50 years at the Johns Hopkins Hospital. Four of these were seen in 1946.

The literature reviewed is mostly old. Local genital lesions in the puerperium are usually mild and respond well to antitoxin. Pregnancy may aggravate diphtheria or may have no effect on it. Severe diphtheria is reputed to cause a high rate of abortion or premature labour, but is not associated with foetal abnormalities. Immunity in the newborn is not invariable, but the passage of antitoxins across the placenta has been proved. Passage of diphtheria bacilli or toxins has not been observed.

The present authors describe 5 cases in detail. One was mild, at 36 weeks, easily treated, and there was no effect on pregnancy, labour, puerperium, or baby. The second patient was admitted after a tracheotomy at 28 weeks; she made a slow recovery and was delivered normally at term of a healthy child. The third had a mild attack at 9 weeks which responded rapidly to treatment; she had a normal delivery at term. The fourth case was more severe, at 35 weeks, with palatal paralysis, difficulty in accommodation, and early myocarditis. After a long labour at term the patient was delivered by forceps. The baby developed transient unilateral palatal paralysis after 24 hours. No report is given of the result of pharyngeal swabs

from the infant. It had less than o.oor unit of antitoxin per ml. of blood, although the mother was Schick-negative. It was given 20,000 units of antitoxin, but the paralysis was thought to be due to the difficult labour rather than to the toxin of diphtheria. The infant left hospital on the tenth day in good condition. The last patient developed diphtheria of moderate severity with mild myocarditis at 14 weeks, and her recovery was complicated by serum sickness. Later she developed peripheral neuritis which responded to rest and thiamine. She showed no tendency to abort and had a normal delivery at term.

The authors conclude from their cases that the diphtheria was not adversely affected by the pregnancy, or the pregnancy by the diphtheria. Diphtheria and its complications should be treated as

in non-pregnant patients.

Aileen M. Dickins

349. Cervical Pregnancy.

By D. Dougal. *J. Mt Sinai Hosp.*, 14, 184-189, Sept.-Oct. 1947. 4 figs., 3 refs.

350. Advanced Abdominal Pregnancy.

By L. Branscomb. Amer. J. Obstet. Gynec., 54, 874-878, Nov. 1947. 5 refs.

351. Abdominal Pregnancy: Birth by Rectum. By W. W. Brown and C. Rucker. Sth. med. J., 40, 905-908, Nov. 1947. 2 figs., 1 ref.

352. Ectopic Pregnancy. A Study of 174 Cases. By W. C. DANFORTH. J. Mt Sinai Hosp., 14, 269-75, Sept. Oct. 1947. 2 refs.

353. Bilateral Simultaneous Tubal Pregnancy. By L. R. GORMAN. Amer. J. Obstet. Gynec., 54, 698-699, Oct. 1947.

354. Simultaneous Tubal Abortion and Uterine Pregnancy.

By H. Acosta-Sison. Amer. J. Obstet. Gynec., 54, 700-701, Oct. 1947. 8 refs.

355. Diagnosis of Atypical Uterine Rupture. By M. S. Klein. Akush. Ginec., No. 4, 35-38,

A case of rupture of the uterus due to perforation of the uterine wall by the chorionic villi of a placenta accreta is fully described. The author considers that previous trauma to the uterus (this includes curettage) and previous inflammation are a potent predisposing cause of pathological adherence of the placenta.

Nicolas Tereshchenko

356. X-ray in Rupture of the Uterus.

By G. W. MYLKS, A. B. BROWN, and W. A. Jones. *Canad. med. Ass. J.*, 57, 337-340, Oct. 1947. 2 figs., 15 refs.

The authors review the literature on rupture of the uterus and give an adequate account of its incidence, aetiology, symptoms, prognosis, and treatment.

The case described is of a woman aged 40, 6-para, 7-gravida, in labour for 22 hours, when she experienced a sudden severe pain followed by complete relief. Generalized abdominal pain and a fall in blood pressure then developed. No oxytocics had been given. The authors report that "the baby was easily felt lying on its left side with a rounded tumour-like mass low in the abdomen on the right." A soft-tissue radiograph was taken which confirmed the diagnosis, showing "a good part of the foetus lying outside the body of the uterus." Laparotomy revealed a 9-lb. (4 kg.) baby lying in the abdomen and a 5-inch (12.5 cm.) tear in the uterus. The authors conclude that there may be many cases where a radiograph would be valuable, since many cases of rupture are undiagnosed, but they add that "the extra handling necessary to take the plate may not be worth the risk to the patient."

[The details given in this case seem to indicate that the clinical diagnosis had already been made. The radiograph hardly seems to have been necessary, thus confirming the authors' own statement that the extra risk involved does not seem to be justified by the nature of the information obtained.]

B. Sandler

357. Diagnosis and Treatment of Uterine Rupture. By L. S. Persianinov. Akush. Ginec., No. 4, 27-

35, 1947.

A series of 262 cases of rupture of the uterus is analyzed, 202 cases being collected from Russian medical publications during the period 1909 to 1941, and 60 cases from the records of the author's. hospital area (18 of these were personally seen by the author). In only 30 of the cases was there any evidence of excessive uterine contractions; in 142 cases uterine contractions were normal in character, in 67 cases they were weak and poor, and in 23 cases there was uterine inertia. The various abnormalities of labour and/or of the uterus noted, singly or in combination, were: (1) mechanical obstruction (disproportion or malposition) in 92 cases; (2) inflammatory lesions of the uterus or adnexa in 83 cases; (3) degenerative lesions of the uterine muscle in 76 cases; (4) previous caesarean section in 29 cases; (5) previous abortion in 12 cases; (6) placenta praevia in 5 cases; (7) previous rupture of the uterus in 4 cases; (8) perforation of the uterine wall by chorionic villi in 4 cases; (9) infantilism of the uterus in 3 cases; and (10) previous extrauterine pregnancy in 2 cases. Only 15 cases were diagnosed as typical cases of threatened rupture of the uterus; in addition 16 had some of the classical signs of threatened rupture of the uterus. Altogether 135 cases were diagnosed at the time of rupture, 53 were diagnosed during vaginal exploration for retained placenta, 29 after their return to the ward, 18 at a subsequent laparotomy for intestinal obstruction, 13 at necropsy for sudden death, 7 a few days after labour, and 5 a few months after labour during subsequent surgical procedures; in 2 cases there is

no indication as to when the rupture was recognized. Twenty-four of the ruptures occurred before the onset of labour, 5 of them in the first half of pregnancy. Three patients recovered without treatment; 31 were treated expectantly (with 22 deaths); 36 died before operation could be carried out; and 207 were treated by operation (with 80 deaths). In 58 cases the uterine tear was sutured (with 12 deaths-20.7 per cent); in 66 cases a subtotal hysterectomy was performed (with 25 deaths—37.9 per cent); and in 68 cases a total hysterectomy was performed (with 28 deaths-41.2 per cent). The total mortality was thus 47 per cent. The foetal mortality was 91.8 per cent, only 21 of the 257 viable foetuses surviving (II by spontaneous delivery, 8 by laparotomy, I by forceps delivery, and I by version and extraction).

Nicolas Tereshchenko

358. Spontaneous Uterine Rupture.

By C. Bisson. *Canad. med. Ass. I.*, 57, 583-585, Dec. 1947. 10 refs.

359. Rupture of the Pregnant Uterus.

By G. W. EASLEY, F. J. BURIAN, and R. T. RAPP. West Virginia med. J., 43, 383-388, Dec. 1947. 2 figs., 18 refs.

360. Spontaneous Haematoma of the Rectus Abdominis in Pregnancy. (Hématome spontané du grand droit au cours de la grossesse.)

By —. DIGONNET, —. THOYER-ROZAT, and —. DUCRET. Rev. franç. Gynéc., 42, 265-269, Oct. 1947. 16 refs.

361. Rupture of Rectus Abdominis Muscle During Pregnancy. Report of Two Cases.

By J. Morgan. Lancet, 2, 721-722, Nov. 15, 1947. 5 refs.

#### LABOUR.

362. The Problem of Delivery of the Non-Resident Patient.

By E. D. Colvin, R. A. Bartholomew, and W. H. Grimes. *Amer. J. Obstet. Gynec.*, 54, 755-765, Nov. 1947. 9 refs.

363. Follicular Hormone and Labour. (Follikelhormon und Geburt.)

By J. Froewis. Zbl. Gynäk., 69, 225-238, 1947.

3 figs., Bibliography.

The author discusses the relation of the follicular hormone to labour and the more important results obtained by experiment in animals and by clinical trial. The amount of follicular hormone in the blood and urine increases in pregnancy, but quantitative results are variable, particularly in relation to the onset of labour. The reason for these variable results is discussed, and the difficulties occasioned by the distinction between free and combined follicular hormone, and between biologically active and inactive forms, are men-

tioned. Certain general conclusions are drawn from a study of the literature. Reports of the use of follicular hormone in connexion with labour record successes and failures in about equal numbers. It is not possible to cause the onset of labour with follicular hormone alone in less than 14 days, and any good results obtained are nearly always due to the combined use of hormone and oxytocics, such as pituitary extract. Most authors agree that follicular hormone sensitizes the uterus.

At the Innsbruck clinic in 1939-40 follicular hormone alone was used to initiate the onset and to make easier the course of labour, while in 1940-41 and in 1941-42 the older drugs, such as quinine and pituitary extract, were used. The author compares the results obtained in these years and publishes graphs of tocometric measurements of uterine contractions and of the effect of oestrogen and quinine on the contractions. The general conclusion was that the average length of labour was longer in the year when follicular hormone was used, but there were no marked differences in other respects. There was no evidence that the follicular hormone, even in massive doses, had any immediate effect on the onset or course of labour, and any effect was certainly less than that of quinine. It is thought, however, that the follicular hormone is of value in preparing the uterus for labour. In the present state of our knowledge it is wiser to use the better-known oxytocics when such are indicated, and to reserve the use of follicular hormone for cases in which there is reason to suppose that this hormone is deficient.

L. W. Lauste

364. Third Stage of Labour. I. Measurement of Blood Loss. II. Intravenous Ergotrate.

By J. K. Quigley. Amer. J. Obstet. Gynec., 53,

271-274, Feb. 1947. I fig., I ref.

Most obstetricians would agree with the author that the placental stage of labour is the worst managed and the most dangerous, and that most present-day theories about it are wrong. author believes (and has observed) that separation of the placenta takes place a minute or two after the birth of the child instead of the 15 or 20 of tradition. Once it has separated, he holds, it should be expelled or expressed by the obstetrician, thereby lessening bleeding; "spontaneous expulsion of the placenta to-day is not often seen, the use of analgesia and anesthesia prevents this " [and, he might have added, so does posture]. He is an "active third stager", shortening the stage by intravenous injection of ergotrate (ergometrine) as soon as the head emerges over the perineum; he always measures the blood loss (by a simple device, which he illustrates) and begins to replace it by plasma or blood as soon as it exceeds 300 ml. He has used his method in 430 private cases and is well satisfied with it. Tables are given showing amount of blood loss and length of the third stage in these cases. Eardley Holland

365. Discussion on the Management of the Normal Third Stage of Labour and of Haemorrhage Therein.

By J. D. S. Flew, H. N. LLOYD, P. DENHAM, and G. F. GIBBERD. Proc. R. Soc. Med., 40, 370-

376, May 1947.

Bleeding in the third stage of labour has always provided controversial material for the obstetrician, and the present discussion was timely. Flew was concerned mainly with the teaching of treatment to students and midwives. He stressed the dangers of fundal manipulation and Credé's method, and had been impressed by the series of cases at University College Hospital, London, when ergometrine had been given. Manual removal of the placenta had been unnecessary in 500 cases and no contraction ring had been diagnosed.

Lloyd said that postpartum haemorrhage was one of the most frequent causes of the flying squad being called out. A routine treatment had been developed for critical cases. A blood drip transfusion was started with Rh-negative blood, morphine was given, and when the general condition of the patient improved she was anaesthetized by "pentothal" and manual removal of the placenta

was carried out.

Denham described the present routine in Dublin. He considered the normal third stage to be accomplished within half an hour; if haemorrhage occurred, Credé's method was tried once only, then under anaesthesia followed by manual removal if the Credé method failed. If the placenta was retained without bleeding, intervention was delayed for another half-hour.

Gibberd, in summarizing, stipulated that a watch be kept on the fundal level, that no oxytocics be used before placental delivery, and (given proper conditions) a trial of Credé's method be made after 2 hours. He thought truly adherent placenta very rare. Difficulty in delivering the placenta was due to inaccessibility of the uterus

or to a contraction ring.

Kenneth Bowes

366. An Outline of the Conduct of Physiological Labour.

By G. D. READ. Amer. J. Obstet. Gynec., 54, 702-710, Oct. 1947.

367. A Radiological Study of Uterine Evacuation-By J. Dalsace. J. Mt Sinai Hosp., 14, 175-183, Sept.-Oct., 1947. 8 figs.

368. The Autonomic Nervous System in the Genesis of Changes in the Pulse and Arterial Pressure in Labour. (Il sistema nervoso vegetativo nella genesi delle modificazioni del polso e della pressione in travaglio di parto.)

By A. PAVONI. Montt. Ostet.-Ginec., 18, 125-144, Jan.-June 1947. 3 refs.

369. The Importance of Rupture of the Membranes before the Onset of Labour. (De betekenis van het breken der vliezen voor het begin der baring.)

By E. Tonkes. Ned. Tijdschr. Geneesk., 91, 3616-3618, Dec. 13, 1947. 2 refs.

370. The Psychic Component of Pain in Gynecology and Obstetrics. A Sensory Conditioning Process.

By W. E. HUNTER. Amer. J. Obstet. Gynec., 54, 848-854, Nov., 1947. 14 refs.

371. The Use of Ergot for Induction of Labour and for the Third Stage of Labour.

By W. D. A. CALLUM. *Edin. med. J.*, 54, 296-305, June, 1947. 18 refs.

The purpose of this article is to stimulate interest in the controversial subject of the use of ergot before the delivery of the placenta. In the first part of the paper the use of ergot for the induction of labour is discussed, the second part being devoted to its use at the end of the second stage of labour. For the induction of labour a semi-synthetic substance methyl-ergometrine ("partergine" or "methergine") is used. It is prepared for oral administration, each millilitre containing 0.075 mg. of inethyl-ergometrine tartrate.

The method, which has been used in 25 cases, is as follows. At 5 a.m. the patient is given an ounce (28 ml:) of castor oil; a warm soap-and-water enema is introduced an hour later. Starting at II a.m., 0.5 ml. of partergine diluted in 10 to 15 ml. of water is administered orally, and this is repeated at halfhourly intervals for a further three doses. A similar course of partergine is given on the following 2 days if labour has not started. The indications included toxaemias of pregnancy, intrauterine foetal death, premature rupture of membranes, post-maturity, and marked hydramnios. There were no cases earlier than the thirty-sixth week. Disproportion is a contra-indication. Back-ache and lower abdominal discomfort occurred more or less simultaneously, and shortly afterwards contraction of the uterus could be felt by abdominal palpation. There was no evidence of uterine tetany. Labour appeared to be slightly shortened. Blood pressure was not affected, and there were no untoward effects on the foetus. If uterine tetany should occur it is advised that magnesium sulphate (2 ml. of a 50 per cent solution) or magnesium gluconate (10 ml. of a 20 per cent solution) should be given intravenously. The only claim made for this method of induction is that it is as successful as any other of the betterknown methods. It was successful in 80 per cent of the 25 cases in which it was used. It is believed to be much safer than ergometrine, the use of which has been followed by serious foetal complications.

At the end of the second stage (100 cases are reported) 0.125 mg. intravenous ergometrine is used. It is given after the birth of the anterior shoulder. This is important, because the full effect of ergometrine is obtained only when the foetus is still distending the birth canal. The drug usually acts on the uterus 20 or 30 seconds after injection, causing firm contraction of the uterus which detaches the placenta completely from its attachment and pushes it into the lower segment or

vagina. It can be expressed manually, with the aid perhaps of slight traction on the cord. The amount of blood lost is markedly reduced; in 75 per cent the loss was minimal—that is, less than 150 ml. The third stage rarely lasts longer than 5 minutes, and in only 3 cases was it longer than 20 minutes. In 1 case the placenta was retained and manual removal was required. A possible danger would be its use in the case of undiagnosed twins.

T. C. Clare

372. Further Studies with Methergine and Its Effect on the Pregnant Uterus.

By J. C. Brougher. West. J. Surg., 55, 371-374,

July, 1947. 19 refs.

In this paper the author follows up his previous work on "methergine" (West. J. Surg., 1945, 53, 276) by a description of 750 further cases treated with this new oxytocic drug, and quotes the results obtained by other workers. Methergine is a semisynthetic ergot substance (methyl-ergometrine), a 2-butanolamide of d-lysergic acid. It is given for the same reasons as ergometrine and other ergottype drugs, and has been found to be more effective in shortening the third stage of labour and in reducing blood loss. No toxic effects have so far been noted. In the present series of 750 cases, methergine was given routinely in doses of 1 ml. intravenously when the foetal shoulder appeared; this dose was uniformly effective in 20 to 30 seconds and the action lasted for 6 to 8 hours (the effect of pituitary preparations is said to last for only 30 minutes). In 3 cases manual removal of the placenta was required; there were no maternal deaths in this series, and none of the 9 foetal deaths could be attributed to the drug.

Methergine tablets of 0.25 mg. given for 2 days during the puerperium resulted in satisfactory involution. [Moir and Russell (J. Obstet. Gynaec. Brit. Emp., 1943 50, 94) claim that the routine administration of oxytocics in the puerperium impairs involution by cutting down the blood

supply to the uterus.]

Labour was induced successfully in 20 cases by hypodermic injections of 1 to 3 minims (0.06 to 0.18 ml.) of methergine (0.2 mg. per ml.) every 30 minutes until labour started, and the results are compared with those in a similar series induced by "pitocin". The minimum effective dose of methergine was 2 minims (0.12 ml.); of pitocin, 1 minim. The average time taken to start labour was 5.03 hours with methergine, 3.1 hours with pitocin; the average duration of labour after methergine induction was 10.2 hours, and after pitocin induction 8.3 hours. In all cases the membranes were ruptured artificially after the third or fourth injection of the drug. No case of tetanus uteri occurred.

The advantages of methergine over other oxytocic drugs are claimed by the author to be (r) that it is safer for the foetus, and more reliable in its results than quinine; (2) that it is more reliable for induction than castor oil; (3) that the unde-

sirable side-effects which have been encountered from time to time with pituitary preparations—such as uterine tetany, convulsions, anaphylactic shock, rise in blood pressure, and oliguria—have apparently never been produced by injections of methergine.

Margaret Puxon

373. The Conduct of Trial of Labour.

By A. W. Andison. Canad. med. Ass. J., 57, 527-531, Dec., 1947.

374. Induction of Labor—Using a Voorhees Bag. By R. L. NEWMAN. J. Kansas med. Soc., 48, 501-503, Nov., 1947. 18 refs.

375. Experience with Midpelvic Dystocia. Preliminary Report.

By W. C. Eller, W. F. Mengert, W. H. Andrew, and R. J. Jennett. Amer. J. Obstet. Gynec., 53, 823-828, May, 1947. 3 figs., 5 refs. Mid-pelvic dystocia is unlikely to occur in

patients with average inlet and outlet measurements but may occur with inlet and outlet measurements at the lower limit of normal. It has been suggested that mid-pelvic capacity is best evaluated by summation of the interspinous and posterior sagittal diameters. The authors, using a combination of X-ray mensuration and graphic portrayal, found that the frequency of instrumental delivery and the foetal and infant death rate diminished as this sum increased. The pelvic size and shape at the mid-plane were graphically portrayed in a diagram according to the method described by Mengert and Eller (Amer J. Obstet. Gynec., 1946, 52, 1032). A plastic transparent model representing a small, medium, or large foetal head was superimposed on the pelvic diagram, thus allowing an opinion to be formed as to whether the head would pass or not, though the strength of the uterine contractions and the mouldability of the head must obviously be considered as well. Evaluation of pelvic capacity by this method in 140 patients showed that dystocia was more common when the sum of the interspinous and posterior sagittal diameters was less than 14 cm.

F. J. Browne

376. Dystocic Labor followed by Amenorrhea and Diabetes Insipidius.

By M. Berlind. *Med. Rec. N.Y.*, 160, 731-733, Dec., 1947. 2 refs.

377. Dystocia due to Complete Atresia of the Vagina Originating during Pregnancy. (Dystocie par agglutination totale du vagin pendant la grossesse.)

By P. Burger. *Gynécologie*, 44, 209-213, July-Aug., 1947.

378. Intravenous Pituitrin Injection in the Treatment of Haemorrhage due to Uterine Atony during Parturition. (L'injection intraveineuse d'extrait de

lobe postérieur d'hypophyse dans le traitement des hémorragies de la délivrance causées par l'atonie utérine.)

By A. GINGLINGER. Bull. méd., Paris, 61, 307-

309, July 21, 1947.

The author advocates the use of intravenous injection of posterior pituitary extract under light general anaesthesia as the most rapid and efficacious method of treatment of uterine atony after delivery of the placenta.

[He does not mention the equally successful treatment of direct injection of pituitary extract into the uterus in these cases of severe haemorrhage, and this article adds nothing new to our knowledge of the use of posterior pituitary extract.]

Gladys Dodds

379. The Management of Breech Presentation. By H. H. WARE, W. C. WINN, and E. C. Schelin. Amer. J. Obstet. Gynec., 54, 748-754, Nov., 1947. 14 refs.

380. Face Presentation. (Presentation de cara.)
By J. L. Jiménez. Toko-ginec. pract., 6, 331-333, Nov., 1947.

381. A method of Delivery for Hydrocephalus Associated with Breech Presentation.

By D. N. Danforth. Amer. J. Obstet. Gynec., 54, 694-695, Oct., 1947. I fig., I ref.

382. Cuban Concept of the Cephalopelvic Disproportion Syndrome and its Treatment.

By H. V. Pineda and A. S. Ramirez. Sth. med. J., 40, 914-919, Nov., 1947.

383. Dangers of Intrauterine Intervention. (Gevaren van intra-uterine ingrepen.)

By W. F. Bijvoet. Ned. Tijdschr. Geneesk., 91, 3647-3650, Dec. 13, 1947. 8 refs.

384. Placenta Accreta.

By F. Beltrao. *Med. Cirurg. Farm.*, 139, 629-641, Nov., 1947. 6 figs., 12 refs.

385. Placenta Accreta as a Cause of Concealed Antepartum Haemorrhage.

By C. G. BARNUM, F. HARTMAN, and F. BRUNDAGE. Connecticut med. J., 11, 900-903, Nov., 1947. 5 refs.

386. Spontaneous Delivery of Placenta in Front of Foetus without Haemorrhage.

· By M. H. LLOYD. Brit. med J., 2, 822, Nov. 22, 1947.

387. Blood Loss in Labour.

By J. Saucier. Canad. med Ass. J., 57, 434-436, Nov., 1947.

388. Obstetric Shock. (Shock Obstetrico.)

By E. Molinero and C. Alba. Toko-ginec. pract., 6, 303-312, Nov., 1947. 44 refs.

389. Incomplete and Complete Lacerations of the Perineum—Their Surgical Treatment.

By L. E. PHANEUF. Bull. New Engl. med. Center, 9, 218-219, Oct., 1947. 10 refs.

390. Oedema of the Umbilical Cord. (Ueber das Oedem der Nabelschnur.)

By W. Walz. Zbl. Gynäk., 69, 144-148, 1947. 6 figs., 6 refs.

### ANAESTHETICS, ANALGESICS

391. Labour with Diminished Pain Obtained by a New Oxytocic-Analgesic Compound. (A propos de l'accouchement à douleurs atténuées obtenu par un nouveau complexe ocyto-analgésique.)

By E. LÉVY-SOLAL, F. MERCIER, and A. REMLINGER. Bull. méd., Paris, 61, 301-305, July

21, 1947. 13 refs.

The effect of the majority of analgesic drugs in general use wears off in the later stage of labour when the pains become more severe. It may then be necessary to repeat the analgesic at a late stage of labour at the risk of a toxic effect on the foetus and of prolonging labour by weakening the contractions. An attempt has been made to solve this clinical problem by giving an analgesic drug combined with a mild oxytocic drug. The analgesia gives good relaxation between the pains, while the oxytocic increases the strength and maintains the rhythm of the contractions. The formula used is:

Dihydroxycodeinoue campho-sulphonate 7.5 mg. Dihydroxycodeinone phenylpropionate 5.0 mg.

Dihydroxycodeinone phenylpropionate 5.0 mg. Scopolamine campho-sulphonate ... 0.2 mg. Ephedrine campho-sulphonate ... 20.0 mg. Sparteine sulphate ... 80.0 mg. Physiological saline to ... 2.0 ml.

When the cervix is about two fingers dilated in a primipara, or when it is taken up in a multipara 4 ml. is given intramuscularly. The drug acts within 8 minutes after injection, and its effect lasts for 3½ to 4½ hours. In a few cases a second injection may be required; 2 ml.—that is, half the original dose—is then given.

The results in 116 cases are recorded. The effect was good; there was only one forceps delivery and no foetal mortality. After a single injection the results are recorded as very good in 42.7 per cent, good in 35.4 per cent, poor in 4.5 per cent, and unsuccessful in 6.5 per cent. Ten patients had two injections with the following results: very good,

1; good, 3; poor, 4; unsuccessful, 2.

Gladys Dodds

392. Use of Bromides in Gynaecology and Obstetrics. (Emploi des bromures alcalins en gynécologie et obstetrique.)

By L. S. Toumanski. Sem. Hôp., Paris, 24,

442-445, Feb. 22, 1948. 6 figs., 3 refs.

393. Anaesthesia in Labour and Caesarean Section. By C. N. PATON. *Med. J. Aust.*, **2**, 589-592, Nov. 15, 1947. 15 refs.

394. Presacral Anaesthesia in Obstetrics and Gynaecology.- (L'anesthésie présacrée en obstétrique et en gynécologie.)

By Z. Kubes. Schweiz. med. Wschr., 77, 1232-

1235, Nov. 22, 1947. 26 refs.

395. Two Hundred Cases of Obstetric Analgesia. (A propos de 200 cas d'analgésie obstétricale.)

By J. Scenla. Tunisic mcd., 35, 5-17, Sept.-Oct., 1947.

#### PUERPERIUM.

396. Controlled Early Ambulation in Obstetrics. By H. F. Burkons. Ohio St. med. J., 43, 1050-1053, Oct., 1947. 4 refs.

397. The Venous System in the Puerperium. (Sistemo venoso e stato puerperale.)

By A. Zambonini. *Riv. ital Ginec.*, 30, 135-157, 1947. 48 refs.

398. Venous Thrombosis and Pulmonary Embolization in Obstetrics and Gynecology.

By H. Neuног. J. Mt Sinai Hosp., 14, 520-528, Sept.-Oct., 1947.

399. Clinical and Experimental Contribution to, and Critical Considerations of, the Genesis and Significance of Aromatic Compounds in the Blood in the Puerperal State and in some Gynaecological Affections. (Contributo clinico-sperimentale e considerazioni critiche sulla genesi e sul significato della aromatemia nello stato puerperale ed in alcune forme ginecologiche.)

By D. CAZZOLA. Monit. Ostet.-Ginec., 18, 65-

94, Jan.-June, 1947. 54 refs.

400. Puerperal Uterine Inversion. (Inversión uterino puerperal.)

By F. A. Guzman. Rev. méd. Rosario, 37, 625-630, July, 1947. 21 refs.

401. Puerperal Tetanus: A Report of Two cases, One Associated with a Pulmonary Embolism Infected with Clostridium tetani; also a Case Report of Postabortional Tetanus.

By J. I. Tonge. *Med. J. Aust.*, 1, 726–729, June 14, 1947. 11 refs.

Two cases of puerperal tetanus are fully described from the clinical aspect and necropsy reports are included. One patient had a spontaneous delivery, the only obvious trauma being a small tear in the fourchette, which was repaired with catgut. The second patient had an instrumental delivery, episiotomy, and manual removal of the placenta. In the first case respiratory symptoms (due to embolus) appeared on the seventh day of the puerperium, and by the thirteenth day a lobar pneumonia was present. The next day signs and symptoms of tetanus appeared, the patient's con-

dition deteriorated, and death occurred a day later. Clostridium tetani was grown in pure culture from the infarcted area of the lung and the cervix uteri (swabs obtained 19 hours after death), and the author suggests that the presence of Cl. tetani in a pulmonary embolism must be unique. In the second case the signs and symptoms of tetanus appeared 7 days after delivery, death occurring on the ninth day, Cl. tetani was isolated postmortem (swabs taken 29 hours after death), but the organs from which the growth had been obtained could not be determined, as the swabs taken were unfortunately treated as a single specimen.

The author considers the various possibilities as regards the portal of entry of the organismcatgut, dressings and vulval pads, bowel—and the possibility that spores lay dormant in various organs and only became active after trauma to these organs. In the two cases described the catgut was tested and found to be sterile, and it was considered unlikely that the dressings were responsible. In the first case it is possible that the organism entered through the cervix and infected the pelvic veins, from which the embolus had probably arisen; alternatively, the tetanus spores may have lain dormant in the lung, the embolus proving the necessary damage for their activation. In the second case auto-infection could easily have occurred from the bowel, but data regarding this mode of infection are scanty.

A case of post-abortional tetanus is described in which the organism was recovered from the placental debris removed by curettage ro days after the abortion, which was self-induced, probably by syringe. Tetanus appeared clinically on the eighth day, and death occurred on the thirteenth day after the abortion. A short review of the literature on the subject is included and the rarity of tetanus as a puerperal infection is noted. An investigation into the possibility of faecal contamination with

Cl. tetani is suggested.

E. L. Nicolson

402. On the Prophylactic Use of Vaginal Sulfanilamidothiazole Treatment against Puerperal Infections. [In English.]

By R. FAHRAEUS. Gynaecologia, Basel, 124,

1-11, July, 1947. 16 refs.

The literature is reviewed on the prophylactic use by oral administration of sulphonamides in labour and the puerperium. The majority of investigators showed a reduced morbidity and mortality rate in some thousands of cases with varying dosage of sulphonamides.

The author reports the result of his investigation in primiparae of the effect of intravaginal application of sulphonamides in the puerperium, a method he adopted because of the known toxic effect of sulphonamides by mouth. His series cannot be compared with others in which sulphonamides were given orally. Incidence of extra-genital infections is reduced by oral administration while it is unaffected by local application. Two vaginal

suppositories each containing I g. of sulphathiazole were inserted into the posterior fornix every twelve hours from the time the patient was admitted in labour until the fifth day of the puerperium. The number of suppositories used during labour was not strictly uniform but depended on the duration of labour; 185 patients had between 11 and 14 g. and 26 had more than 14 g., while I patient had less than 11 g. Alternate patients admitted were used as controls. The two groups, control and treated, were closely comparable as regards age, duration of labour, time between the rupture of the membranes and delivery, loss of blood during delivery, number of operative and breech deliveries, and the haemoglobin level during the puerperium.

The pyrexia rates in the two groups were compared. Pyrexia was regarded as being present when the rectal temperature was at least 37.9° C. from the second day of the puerperium; this occurred in 16.5 per cent of the treated group and 23.3 per cent of the control group. The difference is statistically significant. Eight of the control group but only one of the prophylactically treated group required treatment by oral administration of sulphanilamide. The pyrexial causes were divided into 3 groups, those in which the infection was probably genital in origin, those in which pyrexia was of unknown origin, and those in which the pyrexia arose from some extragenital source. As vaginal application of sulphonamides could not affect pyrexia due to extragenital causes, the combined numbers of cases where the infection was of genital or unknown origin were compared in the two groups. There were 72 cases in the treated group and 103 in the control group. The difference is not statistically significant but suggests that statistically significant figure might be demonstrable in a larger series. Genital infection occurred in 13, and pyrexia of unknown origin in 11, out of 61 prophylactically treated cases, while 23 and 11 out of 47 control cases had genital infection or pyrexia of unknown origin.

The conclusions drawn from this investigation are that vaginal sulphonamide treatment reduces the incidence of infection but the rarity of severe infections makes routine treatment unjustifiable. In the only case where a local toxic effect was produced—a severe pruritus—the treatment had to be discontinued.

Gladys Dodds

403. Discovery of the Cause and Prophylaxis of Puerperal Fever by Semmelweis. (Die Entdeckung der Verursachung und Verhütbarkeit des Kindbetfiebers durch I. Ph. Semmelweis.)

By E. F. Podach. Arztl. Wschr., 1/2, 872-876, Aug. 30, 1947.

404. Clinical Diagnosis of Puerperal Infection. (Klinická diagnosa horečky onladniční.)

By J. Lukas. Cas. Lék. čes., 86, 1476-1478, Dec. 17, 1947. 1 fig.

405. Morbidity and Mortality Rates from Puerperal Infection in the 3rd Obstetrical Department of the University of Prague. (Dnesní ústavní lécebné vysledky horečky onladnic.)

By F. Polasek. Cas. Lék. čes., 86, 1478-1481, Dec. 17, 1947.

406. Arthritis in the Puerperium. (Artritis en el estado puerperal.)

By J. Cadi. Bol. Soc. chil. Obstet. Ginec., 12, 89-97, July, 1947. 9 refs.

407. Ileus in the Puerperium. (Ileus im Wochenbett.)

By P. Huessy. Zbl. Gynäk., 69, 133-135, 1947.

#### LACTATION.

408. Bacteriology of the Collection and Preservation of Human Milk,

By J. WRIGHT. Lancet, 2, 121-124, July 26,

1947. 3 figs., 5 refs.

Bacteriological examinations were carried out on human milk obtained from four maternity hospitals (A, B, C, and D) with different methods of collection and various degrees of cleanliness, and also on human milk obtained by an "ideal" technique-that is by spraying the milk from cleaned nipples direct into autoclaved bottles and chilling it immediately. The roll-tube method was used with "yeastrel"-milk-agar as the medium, and aerobic incubation for 3 days at 37° C. The results showed a striking difference. The bacterial counts of the milk samples from maternity hospitals A and C ranged from 3,700 to 8,000,000 (mean, 2,230,000) per ml., while counts of o to 2,500 (mean, 298) per ml. resulted from samples taken by the "ideal" technique. An analysis of the causes of contamination revealed that collecting-bowls and breast pumps were the main sources. By boiling these utensils, without any other precautions, the bacterial count could be reduced by 99.3 per cent. Based on these findings a practicable, clean ward technique of expression and collection of human milk is recommended. Bacterial counts of milk samples collected by this method ranged from 70 to 39,000 (mean, 8,600) per ml. Further, three methods of heat treatment of the milk were tested. Boiling the milk in a saucepan with lid immediately after collection proved the easiest and safest way for ward use.

The bacteria flora were ascertained of 85 individual and 10 pooled specimens of human milk taken from hospitals A and B, collected mainly by the clean ward technique. The flora consisted of bacteria found commonly on the skin or in the upper respiratory tract. Micrococci were the commonest bacteria, many of them with lipolytic action. Non-haemolytic and α-haemolytic streptococci were the next common. Staphylococcus aureus (coagulase-positive) was found in only 18 out of 95 samples of pooled milk, but in 6 out of 8 samples if expressed drops were examined. The samples obtained from vessels used without

previous boiling showed evidence of faecal contamination (Bacterium coli, Bact. aerogenes, and Bact. alcaligenes).

To serve its purpose pooled human milk must correspond to optimal requirements of purity. Omission of fundamental hygienic measures during collection will result in bacterial contamination. The establishment of a network of human-milk banks needs standardized methods of collection and preservation.

M. Dynski-Klein

409. The Effect of Stilbestrol on the Lactating Breast,

By E. MATLIN. Penn. med. J., 51, 63-64, Oct., 1947. 11 refs.

410. Penicillin and Acute Puerperal Mastitis.

By C. P. Hodgkinson, Amer. J. Obstet. Gynec.,

53, 834-838, May, 1947. 18 refs.

The authors report a series of 66 cases of puerperal mastitis. Before penicillin became available 12 patients had been treated in the cellulitis stage with various sulphonamides. Nine of these cases required incision and drainage—a failure rate of 75 per cent. Four responded promptly to penicillin after sulphadiazine had failed.

In 18 of the present series an abscess had already developed, and 16 of these required incision and drainage while 2 resolved after aspiration; 48 were treated by intramuscular penicillin during the cellulitis phase, with complete resolution in each case. The average stay in hospital was 6.1 days, as compared with 42.5 days when an abscess had to be incised and drained. In the earlier cases a total of 840,000 Oxford units was given-25,000 units intramuscularly every 3 hours for 72 hours, and then 15,000 units every 3 hours for 48 hours. Four of the later cases were treated by penicillin in oil and wax; an injection of 300,000 units was given every second day till three doses had been given, with results as satisfactory as by the first method, whereas admission to hospital was not necessary. The authors recommend that lactation be inhibited by 40 mg. of stilboestrol, as experience showed that if it was continued acute mastitis was liable to develop in the opposite breast. Penicillin could not be identified in specimens of milk from treated patients, and the bacterial count in the milk did not seem to be materially influenced.

F. J. Browne

411. The Prevention of Mastitis: The Nursing Problem.

By E. C. THOMAS. Edinb. med. J., 54, 436-441, Aug., 1947. 4 figs., 3 refs.

412. Treatment of Acute Puerperal Mastitis.

By J. S. Jeffrey. *Edinb. med J.*, 54, 442-446, Aug., 1947. 3 refs.

#### THE INFANT.

413. The Differential Leucocyte Count of the Newborn in Relation to that of the Mother and to the Endocrinology of Pregnancy. (La formula leucocitaria del neonato in rapporto a quella materna ed all'endocrinologia della gestazione.)

By A. INGIULLA and G. DE GIOSUÉ. Riv. Clin. pediat., 3, 129-153, Mar., 1947. 2 figs., 21 refs.

Studies of the blood picture of mother and infant were made immediately after delivery to investigate the mechanism governing the modifications in the white blood cells.

In order to determine approximately how many days of observation were necessary to study the changes in the leucocyte count in the newborn, haematological examinations were performed on 3 infants born at term. After 7 to 8 days the polymorphonuclear leucocytosis and the number of lencocytes returned almost to normal. Investigations were then made simultaneously on 8 mothers and their infants, the examinations being repeated four to six times on each case during the first week of life. The leucocytosis of the newborn tended to persist in some cases beyond the first week of life, but the number of white cells began to decrease in every case immediately after delivery. A moderate monocytosis was often encountered, and in some cases reached a high value. No relation existed between the number of maternal and infant's erythrocytes; neither of the 2 subjects showed corresponding haemoglobin variations. The modifications in the white cell counts of the mother and infant occur in a parallel and synchronous manner; they begin simultaneously in the mother and foetus at the end of the fifth or sixth month of pregnancy and correspond to the variations in the maternal sex hormones. The modifications in the white cell counts reach a peak at delivery and disappear slowly during the first week of life of the puerperium.

Recent study has demonstrated the importance of the action of the sex hormones on the morphological composition of the peripheral blood, and especially the erythro-leucopoietic action of folloculin.

Experiments were therefore made with folliculin. The infant was thought more suitable for the study than the mother, since the latter's hormones were necessary to establish the return to normal of the genital apparatus and to promote breast function. A daily dose of 10,000 i.u. of folliculin was administered for one week to a group of 18 newborn infants. This amount was not considered an overdose, and no evidence was found of ill effects from this dosage. Comparison with the results already obtained showed that there is a definite difference of behaviour between the cases treated with folliculin and the others. The polymorphonuclear leucocytosis was still present in 11 of the subjects at the end of the seventh and eighth day; in 4, the leucocyte count became normal somewhat late; 3 gave a negative response to folliculin, and these results can be added to those in infants not treated with the compound. The red cell count seemed not to be affected by the administration of folliculin.

Rina Saunders

414. The Adrenal of the Newborn.

By M. McNeill. *Ulster med. J.*, 16, 41-45, May,

1947. 4 figs., 12 refs.

The involutionary changes occurring in the adrenal cortex during the neonatal period were studied in 160 infants. There were 19 stillbirths in the series. The adrenals in the majority showed congestion of the X-zone (inner or audrogenic zone of the cortex) with a few degenerative changes in individual cells. A few showed commencing growth of the zona fasciculata. In the 28 infants who died within 24 hours of birth the histological appearances resembled those in the previous group. though there was much individual variation. Thirty-eight infants died between the second and seventh days. Cortical changes were seen to be proceeding with rapidity and by the seventh day the zona fasciculata was well developed in most cases, while degenerative changes involved the entire X-zone with the exception of a narrow peripheral band. In the 34 infants of the 8- to 14-dayold group, about half had an X-zone represented by a connective-tissue network containing degenerating cells. In general, the changes were progressive throughout this group, and also in the next group of 16 infants of from 15 to 28 days old. The final group of infants who died between the ages of I and 3 months showed individual variations. Two infants still had a definite X-zone, while in others there was a more adult configuration of the gland.

Prematurity in these cases had had no effect on the involuntary process, nor were there any changes in the 5 syphilitic infants. Five infants also had major cardiac abnormalities. Here, again there had been no obvious effect on involution. Another 5 infants were anencephalic; in only one of these was there evidence that involution had begun before birth, and the duration in this case had probably not exceeded 8 days. Thus the theory that involution occurs in the second half of pregnancy and produces an adult adrenal gland at birth in the anencephalic monster is not borne out in this series.

R. B. Lucas

415. Asphyxia in the Newborn. (Om asfyxi hos nyfödda.)

By Y. AKERRÉN. Nord. Med., 22, 1269-1278,

May, 30, 1947. 15 refs.

This study from a children's hospital in Gothenburg covers the whole field of asphyxia in the newborn; among the methods recommended for dealing with asphyxia is Ylppö's, in which oxygen is introduced through a catheter into the stomach, whose mucosa is well supplied with capillaries in infancy. The flow of oxygen is graduated by bubbling it through water, great care being taken to avoid

meteorism. Ylppö has shown that considerable aeration of the blood can be effected by this device, which is much simpler and less dangerous than the intratracheal introduction of oxygen. The author betrays no enthusiasm for the various forms of artificial respiration in vogue, for, so long as there are no spontaneous respiratory movements, artificial respiration does not help to dilate the lungs. The danger of violent methods is stressed, and it is suggested that most drugs are valueless, although lobeline may sometimes be effective. On the other hand, much importance is attached to clearing of the upper respiratory passages and stimulating the circulation of the blood by heat. The usual measures for combating shock are also advocated. It is admitted that practically every device for relieving pain during labour entails a certain added risk for the child; the frequency of slight degrees of asphyxia or apnoea in the child has risen considerably since anaesthesia and analgesia have come into more general use. The least dangerous is brief chloroform anaesthesia towards the end of C. Lillingston labour.

416. Some Observations on the Aetiology and Treatment of Prematurity.

By A. M. AGARONOV. Akush. Ginek. No. 5, 53-54, 1947.

417. A Review of 112 Cases of Congenital Hypertrophic Pyloric Stenosis.

By R. M. Todd. Arch. Dis. Childh., 22, 75-85,

June, 1947. 11 refs.

These 112 cases of congenital pyloric stenosis were treated over a period of 8 years in the wards and out-patient departments of the Leicester Royal Infirmary, which serves a population of 550,000 people. They are divided into two series. In series ·A, 40 patients were studied during the illness and again after an interval of 1 to 2½ years; in series B, 72 patients who had had the disease between 1938 and 1945 were followed up. In all patients a palpable pyloric tumour was present. Routine treatment was by 3-hourly feeding with breast milk or half-cream dried milk; administration of "eumydrine" (methyl atropine nitrate), i in 10,000 aqueous solution by mouth half an hour before feeds, 3 to 6 ml.; relief of dehydration by before drug treatment; subcutaneous salines stomach lavage twice daily until there was no residue; rectal lavage every third day if severe constipation was present; and administration of ammonium chloride gr. 2 (0.13 g.) 3 times a day if previous vomiting had been severe. In-patients were nursed in a single-bedded cubicle.

Of the 40 patients in series A, 30 were in-patients, the length of stay in hospital varying from 2 to 40 days; 38 were treated medically and 2 by Rammstedt's operation after a trial of eumydrine; both recovered. There were 2 deaths, I child being moribund on admission and the other contracting gastro-enteritis after discharge. Of the 72 patients in series B, all were admitted and given eumydrine; 3 were operated on as well and 2 of these died.

Altogether there were 10 deaths in this series. Of the total of 12 infants who died 11 were severely dehydrated and 9 had a low birth weight. The age of onset and the age at which treatment was started had no bearing apparently on the mortality. A review of the literature from 1910 to 1944 shows the death rate to have been the same whether medical or surgical treatment was used, although there are wide variations in the reports of individual workers. In recent years mortality has tended to fall with both forms of treatment. Whichever treatment is employed, breast-feeding and nursing in separate cubicles are important factors in reducing the mortality.

Emphasis is laid on the importance of skilled nursing, in medical treatment and of an experienced operator in surgery. If the latter is not available, medical treatment, preferably out-patient, is the choice for most cases. Jacoby's indications for surgical treatment-early vomiting, severe dehydration, absence of infection and of diarrhoea—are discussed. The present results show, however, that many patients in whom, on these criteria, surgery was indicated, recovered with medical treatment. The author considers that medical treatment is indicated in the absence of severe dehydration, or if the child is infected, but that operation should be performed if there is no response to a week's medical treatment, if the child is grossly delaydrated, or if the birth weight is below 61 lb. (2.9 kg.).

After an interval of from 11 to 32 months the patients of series A were admitted for r night for clinical examination and a barium meal. The former revealed no abnormality, but in the majority of those who had had a long stay in hospital-presumably owing to the severity of the disease—there was delay in emptying time. Twenty-six of the older children of series B were similarly investigated; 9 had alimentary symptoms, and 5, all of whom had had a prolonged stay in hospital originally, showed contraction of the pyloric antrum and delayed emptying of the J. Vernon Braithwaite stomach.

418. Etiology of Mongolism. Epidemiologic and Teratologic Implications.

By T. H. Ingalls. Amer. J. Dis. Child., 74.

147-165, Aug., 1947. 5 figs., 46 refs.

The thesis is presented that mongolism results when the foetus of about 8 weeks is injured. Injury may result from uterine disease (generally manifested by haemorrhage) or from a systemic illness such as rubella. Other congenital defects which are related invariably (brachycephaly and maldeveloped auricles, nose, or larynx) or frequently (epicanthus, cataract, septal cardiac defect, phalangeal defects) are also the result of injury to the foetus at about the eighth week, when the appropriate tissues are developing especially rapidly. Thus, for example, at the eighth week the cartilaginous skeleton of the foetal fingers has been completed save for the laying down of the middle phalanx of the fifth finger; injury to the foetus at this stage may therefore be, surmised to be responsible for the frequently associated absence or mulformation of the middle phalanx of the fifth finger of the mongol. Evidence to support this thesis is adduced from the literature.

Although the evidence brought forward is rather thin, the principle by which coexisting congenital defects may be used to indicate the time at which foetal defects have been initiated is a fruitful one.] D. Guirdner

419. Serum Precipitable Iodines in Recognition of Cretinism and in Control of Thyroid Medication.

By E. B. MAN, C. S. CULOTTA, D. A. SIEGFRIED, and C. STILSON. J. Pediat., 31, 154-160, Aug.,

1947. 2 figs., 15 refs.

This investigation was undertaken to ascertain whether or not the measurement of serumprecipitable iodine is useful in the diagnosis of cretinism and in the differential diagnosis between cretinism and mongolism. The subjects were boys and girls 6 weeks to 16 years of age, and the clinical diagnosis was based on the usual criteria for cretinism. Serum iodine was determined by the permanganate-acid-ashing Riggs and Mann method. Except for five slightly high figures for total iodine, all but 3 of the values for serumprecipitate iodine in 72 non-cretin children fell within the 4 to 8  $\mu$ g. per 100 ml. range, which has been defined for euthyroid adults. All values in the 9 cretin children were subnormal. In fact, with the exception of one less accurate total-iodine estimation, all values fell below 2  $\mu$ g. per 100 ml. Clinically recognizable cretinism is therefore accompanied by a distinct decrease in the serumprecipitable iodine.

The serum cholesterol of these children was also studied. It appears that the measurement of serum cholesterol is less reliable than the estimation of serum-precipitable iodine in the diagnosis of cretinism in children. While an elevated serum cholesterol is of value diagnostically, a figure below 250 mg. per 100 ml. does not exclude the possibility of cretinism. Data concerning the response of 6 cretin children to thyroid medication are also presented. Clinically the outstanding fact about these 6 children is that r had responded quite satisfactorily to the administration of desiccated thyroid and 2 had not responded completely.

[As at least 25 ml. of blood is required for the measurement of serum-precipitable iodine, and as some of the infants thus bled had to be given a blood transfusion subsequently, this method of investigation cannot at present be considered of practicable value. Jas. M. Smellie

420. Two New Spanish Cases of Teratoma. (Aportación de dos casos a la casuística teratológica de España.)

By A. F. Gomez. Toko-ginec. práct., 6, 286-295, Oct., 1947. 4 figs., 34 rets.

421. Recent Theories of Aetiology and Pathogenesis of Foetal Monsters. (Sulle più recenti teorie eziopatogenetiche delle mostruosità fetali.)

By G. CATALDI. Riv. ital. Ginec., 30, 158-179, 1947. 80 refs.

422. A Case of Congenital Tuberculosis. (Een geval van congenitale tuberculose.)

By C. B. F. DAAMEN. Ned. Tijdschr. Geneesk., 91, 3607-3601, Dec. 13, 1947.

423. Treatment of Pemphigus Neonatorum. (Revise léčení pemfigu novorozenců.)

-By J. Sibek and M. Sibkova-Hilgertova. Ceskoslov. Gynaek. 12/26, 137-143, 1947. 7 refs.

The treatment of 120 cases of pemphigus neonatorum is reported. The whole surface of the baby's body, front and back, was irradiated with ultra-violet rays. A 500-kilowatt lamp was used, 3 to 4 minutes' irradiation from a distance of one metre being given for the first two consecutive days. After one day's rest another course is given for two days, the irradiation time being increased to five to six minutes. The baby was bathed as usual during the treatment, one to two spoonfuls of " chlorseptol " (a preparation of chloramine) being added to the bath. Some sterile dusting powder was used after the bath. No other treatment was given, the pustules being left alone. The results were uniformly good: 90 per cent of all cases cleared up in 5 days, and the rest within a fortnight.

424. Effect of Nicotinic Acid on Vaccination. [In English.]

By J. Suranyi. Paediat. danub. 2, 3-7, July,

1947. 4 figs., 9 refs.

In first vaccinations the vesicle is said to be caused by the virus, and the areola and infiltration by the allergic reaction of the organism. On the assumption that nicotinic acid would modify the allergic reaction the author gave o.r g. by mouth once a day to every second infant in a series of 200 first vaccinations between the ages of 7 and 14 No undesirable side-effects were produced, and the duration of the reaction was shorter in the treated cases. In the majority, itching and tenderness were either absent or insignificant, the primary vesicle dried in a shorter time, and there were fewer secondary reactions. In fact the vaccination ran a similar course to that seen in very young infants. J. Vernon Braithwaite

425. Early Immunization against Pertussis.

By J. M. Adams, A. C. Kimball, and F. H. Adams. Amer. J. Dis. Child., 74, 10-18, July,

1947. 3 figs., 13 refs.

The authors investigated the possibility of protecting infants against pertussis during the first 6 months of life, and in doing so learnt more about the general production of antibody by young infants. By agglutination tests they demonstrated the inability on the part of some infants to form specific antibody.

Groups of mothers and infants were studied at approximately monthly intervals during the first year of the infant's life. The infants were given three inoculations of 2.5 ml. "Phase I superconcentrate " vaccine (40,000 million organisms per nil.), a total dose of 100,000 million organisms, at weekly or monthly intervals, the individual doses being 0.5, 1, and 1 ml. Details are given of a simple method of obtaining blood from the infants. Mothers immunized during the last 3 months of pregnancy were given three inoculations at 2-week intervals with a total of 100,000 million organisms. In a study of the agglutinating titre of colostrum with Haemophilus pertussis it was found that to obtain satisfactory results the colostrum must be clarified either with ether or by Seitz filtration. It was proved experimentally that such clarification of the colostrum did not remove antibodies from it.

Seven groups were studied: (1) Seven mothers and infants were not immunized and were used as controls. Two of the babies in this group were born with low titres; these fell to zero by 2 weeks of age. All subsequent determinations were negative. (2) Twenty-one babies were inoculated at weekly intervals, the inoculations in all but 4 being completed before I month of age. Six babies showed no rise in titre, the others having definite rises, the mean titre at I month being I in 160. This tended to drop rapidly. (3) Nineteen babies were given inoculations at monthly intervals, immunization in all but 8 being completed before the third month of life. Five babies showed no rise of titre, but the mean titre at 4 to 5 months was 1 in 80. (4) Infants on a high protein diet were given three inoculations, but the protein intake was found to have no effect on the agglutination response. (5) Sixteen mothers were immunized during the last 3 months of pregnancy. The mean titre in the mothers at term was I in 320. The mean titre of cord blood was I in 160; at 2 months of age it was I in 80, but during the first 6 months of life the titre was gradually lost. Three of the babies showed no agglutinating titre in the cord blood. No active immunity developed in utero in babies of immunized mothers. (6) Specimens (142) of mothers' antepartum blood and cord blood were tested. Negative results were obtained in 109 pairs of samples. Four pairs gave positive results at a low level. In 26 cases the titre of cord blood was lower than that of antepartum blood, and in 3 cases it was higher. (7) Thirty samples of colostrum were tested for Haemophilus pertussis antibodies, which were present but in lower titre than in the maternal cord blood. Their significance in the human being is probably negligible.

The authors conclude that early immunization is a safe and practical procedure and very desirable. Reactions to inoculation were negligible. The weekly inoculations gave a surprisingly rapid agglutination response. It remains to be seen whether the titre level can be maintained by con-

tinuing to give antigen at monthly intervals during the early months of infancy.

B. S. P. Gurney

426. The Chemotherapy of Pneumococcal Meningitis in Children. (W Sprawie chemoterapii pneumokokowego zapalenia opon u dzieci.)

By W. Klepacki. Polsk. Tyg. lek., 2,

678-679, June 2-9, 1947. 2 refs.

The favourable results claimed by British workers (Cairns et al.) in the treatment of pneumococcal meningitis with penicillin and sulphonamides encouraged the author to try this method in children. His previous experience with sulphonamides alone had proved disappointing. This report describes 5 children treated with penicillin and sulphonamides, 3 with penicillin alone, and I with sulphonamides alone. Following the Britsh method, penicillin was given intrathecally daily (10,000 to 20,000 units) and intramuscularly; sulphathiazole was administered orally and intramuscularly. The intraventricular route was not used. Short clinical notes are given of all the 9 cases. All the children treated with penicillin only or sulphonamides only failed to respond and died. Of 5 children treated with penicillin and sulphonamides together 3 recovered completely, 1 recovered with a residual bilateral deafness due to internal otitis, and I died. Necropsy revealed thick deposits of pus and fibrin on the surface and base of the brain. The author suggests that these deposits were resistant to penicillin and that they contained a secondary focus of infection. The findings are in complete agreement with those of Cairns. Penicillin should always be combined with sulphonamides in the treatment of pneumococcal meningitis in children. The author finds, however, that in infants and during the first year of life the prognosis remains almost always unfavourable.

J. T. Leyberg

427. Pneumonia in Children.

By A. S. A. Abbasy. Arch. Pediat., 64, 403-410,

Aug., 1947. I fig.

This paper is based on the treatment of 300 patients with pneumonia, "mostly below the age of 2 years", 206 of the cases being of the lobar type and 94 of broncho-pneumonia. The author compares the effect on the course of the disease of sulphonamides (sulphadiazine, sulphapyridine, or sulphathiazole) with that of penicillin; he states that the mortality in the sulphonamide series was 10.9 per cent and in the penicillin series 5.2 per cent.

[There are numerous fallacies in this paper. It seems surprising that when most of the cases were under 2 years of age two-thirds were of the lobar type. The dosage of sulphonamides (0.1 to 0.2 g. per kilo) and of penicillin (2,500 to 5,000 units per kilo per day by 3- or 4-hourly intramuscular injection in some cases, a single dose of 25,000 to 30,000 units per kilo in other cases, and 12-hourly doses of 5,000 to 10,000 units per kilo in others)

was inadequate by British standards. The penicillin was given by eight or nine different methods and in varying dosages, and the resultant groups are too small to permit of calculation of percentages or of conclusions being drawn. In the group of 8 cases of lobar pneumonia treated by 12-hourly injections of penicillin in oil it is stated that the mortality was 12.5 per cent (because 1 patient died), and that 25 per cent (2 cases) were "cured" in 12 to 24 hours. The criteria given for diagnosis and clinical recovery are inadequate.]

R. S. Illingworth

428. Management of Whooping Cough with Special Reference to Infants.

By J. L. Kohn and A. E. Fischer. Amer. J. Dis. Child., 73, 663-670, June, 1947. 7 refs.

The authors note that of 3,668 recorded deaths from whooping-cough in the United States in 1941, 94 per cent were in children under 3 years old. They describe the treatment of 887 infants under I year at Willard Parker Hospital, New York. Diagnosis was usually made by nasopharyngeal swab. Essential treatment included good nursing, oxygen administration (often in a tent), aspiration of nasopharyngeal mucus as and when necessary, parenteral administration of fluids to restore and maintain hydration, and frequent small feeds preceded and followed by aspiration of mucus. Chemotherapy for secondary infection proved helpful in some cases. Mortality varied from 3.5 to 6.7 per cent for the infants under 1 year of age, all of whom were severely ill. The prompt use of oxygen and of suction to aspirate mucus were important factors in the treatment. The low figure for mortality (3.5 per cent) obtained in 1945 was associated with the use of hyperimmune serum. W. F. Gaisford

429. Acute Diarrhea in Infancy and Childhood.

By F. Hurtado and A. J. Aballi. Sth. med. J.,

40, 577–587, July, 1947. 4 figs.

This paper, with its useful tables and diagrams, was presented at the Southern Medical Association's annual meeting, and an abstract of the subsequent discussion is appended. It is based on the authors' experience with infantile diarrhoea in private and institutional practice in Havana, where limited bacteriological studies were made but two new species of Salmonella were identified. Nutritional deficiencies are shown to play a major part in increasing susceptibility now that public health and child welfare activities have reduced the infant mortality from diarrhoea in recent years. The value of various forms of treatment is recognized, including the use of Hartmann's solution (equal parts of saline and 5 per cent dextrose) and of intraperitoneal lactate-Ringer to combat acidosis, and of specific chemotherapy. Some pathological observations on the encephalitic manifestations are described.

430. Intra-gastric Drip Feeding in the Treatment of Infantile Gastroenteritis.

By J. Berkeley. Glasgow med. J., 28, 224-227,

Aug., 1947. 1 fig., 6 refs.

In view of the drawbacks of the normally used parenteral feeding technique in infants suffering from gastro-enteritis the author evolved the following technique. A linen draw-sheet is firmly swathed round the body of the infant and pinned in place so that the arms are firmly pinioned to the sides and only the face is exposed. A fine rubber catheter (No. 5), lubricated with liquid paraffin, is passed into the stomach through the nose and fixed on the forehead with adhesive tape. To facilitate passage of the tube the infant is given small sips of water to drink. Gastric lavage is then performed with I per cent warm sodium bicar-When the returned stomach bonate solution. washings are clear the catheter is connected with a drip apparatus giving fluid at a rate of 20 drops a minute. The child is now given a sedative dose of chloral hydrate either by spoon or by the stomach-tube. Hot-water bottles are placed alongside the rubber tubing to keep the fluid warm. Fluids used were half-strength physiological saline, saline with 5 per cent glucose, and 2.5 per cent "casydrol" with 5 per cent glucose.

The daily fluid needs were calculated on the basis of  $2\frac{1}{2}$  oz. (71 ml.) per pound (0.45 kg.) body weight, plus 3 to 6 per cent if dehydration was present. The drip was used for periods of 12 to 48 hours, after which normal feeding could be started. When the stomach-tube had been in situ for 24 hours it was re-sterilized. If vomiting occurred, fluid administration was stopped. If the tube became displaced it was re-inserted. The author used this method on 36 infants. One vomited but settled down, after another gastric lavage, with a slower rate of drip. None of the infants developed clinical signs of broncho-pneumonia. Postmortem examination of 1 baby who had the drip for 48 hours did not reveal any injury to pharynx or oesophagus, or evidence of broncho-pneumonia. There were no obvious ill effects from the immobilization. The author stresses the importance of adhering to all details in this method. He considers it superior to parenteral therapy.

E. Lejbowicz

431. Icterus Neonatorum: Its Incidence and Cause. By L. FINDLAY, G. HIGGINS, and M. W. STANIER. Arch. Dis. Childh., 22, 65-74, June, 1947. 6 figs., 38 refs.

Icterus neonatorum is usually considered to be due to haemolysis, although functional immaturity of the liver is recognized as a possible cause. This investigation represents an attempt to determine which is the more important factor. The condition was diagnosed, a concentration of plasma bilirubin in cord or postnatal blood of more than 1 mg. per 100 ml. being found. The incidence by this criterion is 81 per cent. Many infants at birth, although not clinically jaundiced,

show a high plasma bilirubin (62 per cent of 110 infants), but it does not reach the high level so often seen a few days later. Nevertheless, it seems that in general the higher the level of foetal bilirubin the greater the chance of the development of jaundice. Immaturity apparently has no relation to plasma bilirubin, although all infants born before the thirty-fifth week of pregnancy become jaundiced. In 16 infants bilirubin was determined in the cord blood and in the blood at intervals during the first 10 days; in 8, it rose sharply to 3 to 9.4 mg. per 100 ml. and jaundice was visible; in 6, the foetal bilirubin was below 1 mg. per 100 ml. but rose slightly to less than 2 mg. per 100 ml. returning to normal by the tenth day; in 2, foetal blood showed hyperbilirubinaemia, which diminished after birth.

The following facts suggest that icterus neonatorum is not due to haemolysis. (1) The most rapid fall in haemoglobin level and red cell count occurs after the second week, when there is no tendency to jaundice. (2) The rate of fall is not greater in jaundiced infants. (3) Immature cells are not present in the circulating blood except in the first few hours; reticulocytes do not rise above I per cent. [Other observers, however, record reticulocytosis up to 5 per cent in normal infants of several months of age.] (4) In normal infants extramedullary haematopoietic tissue diminishes, whereas when undoubted haemolysis occurs it is increased. Moreover, the evidence in favour of the presence of any haemolysin is doubtful, as is the evidence of increased fragility of the red cells-in fact, Findlay (Arch. Dis. Childh., 1945, 20, 64) had préviously found a slightly decreased fragility in the newborn.

To find that hepatic immaturity is the cause of the jaundice, on the other hand, would not be surprising. Many tissues do not reach full function until some time after birth, and, if hepatic immaturity were the cause of hyperbilirubinaemia, the more immature the infant the greater would be the tendency to jaundice; this is a well-known fact. Bilirubin is probably excreted before birth via the placenta, as the bilirubin level in the umbilical artery was found to be higher than that in the umbilical vein. The sudden change from excretion by the placenta to excretion by the child's immature liver might well explain a temporary accumulation of bilirubin in the blood. The albumin/globulin ratio of the plasma protein, however, did not suggest liver insufficiency, nor did the results of the Takata-Ara reaction.

The authors conclude that these tests do not reflect the ability of the liver to excrete bilirubin. The amount of faecal bilirubin was correlated with the weight of the child in 16 cases; in spite of great daily variations, the results showed that non-jaundiced infants excrete bilirubin earlier and in greater amounts. It is concluded that icterus neonatorum is due to hepatic insufficiency rather than to haemolysis.

J. Vernon Braithwaite

432. Kernicterus. A Follow-up Study of Thirty-five Erythroblastotic Infants.

By R. Stiller. Amer. J. Dis. Child., 73,

651-662, June, 1947. 12 refs.

"Of 35 patients with erythroblastosis for whom follow-up records were obtainable, 29 are still living and 6 have died. The ratio of white to negro in this series was 31 to 4. Analysis of the autopsy reports of the 6 deaths failed to show any correlation between the degree of clinical involvement of the central nervous system and the pathological picture. Of the 29 living children 4, or 15 per cent, show signs of involvement of the central nervous system that may be interpreted as evidence of kernicterus. Two of these 4 showed evidence of involvement of the central nervous system in the neonatal period. None of the remaining 25 normal children showed any such neonatal involvement. Transfusion therapy should be directed against the anaemia and is of no value in ameliorating the damage to the brain that has already occurred." —[Author's summary].

433. The Application of our Knowledge of the Rh Factor.

By J. T. Cole. Amer. J. Obstet. Gyncc., 53,

181-189, Feb., 1947. 7 refs.

The purpose of the author is to trace the changes in the policy of the Cornell University College and Hospital as knowledge of the rhesus factor increased and Rh-testing materials became available. He was assigned the problem of keeping abreast with the literature. The statistics of almost 5,000 Rh-factor determinations and a few interesting observations are discussed. This concise record of carefully controlled large-scale work well repays study. In 1943 the supply of Rhtesting serum was pitifully small and examinations had to be limited to women whose obstetric history indicated Rh-factor disasters in their infants. But when, in 1944, a liberal quantity of testing serum became available the following policy was adopted: (1) All antenatal patients were typed at their first visit. (2) Husbands of all Rh-negative patients were typed. (3) Beginning at about the thirty-sixth week, all negative patients had weekly anti-Rh determinations performed. (4) Patients with Rh antibodies were again studied on admission in labour, and cord-blood studies were made 6-hourly. Breast feeding was forbidden and placentae were fully examined for haemolytic disease. (5) The infants of many Rh-negative women without antibodies were also studied for a few days after birth. The usual precautions about the use of Rh-negative blood were, of course, taken.

Tables are given on the incidence of haemolytic disease in the clinic, on laboratory studies of a patient surviving a transfusion reaction as the result of Rh incompatibility, on the foetal mortality in haemolytic disease of the new-born, and on the types of haemolytic disease in relation to foetal mortality.

The author's conclusions are likely to be most helpful to other workers, especially as regards prompt treatment of the infant developing haemolytic disease. The hydropic form of the disease seems to be without a means of treatment, but it is possible to reduce the mortality of the anaemic form. The results of treatment of the type with jaundice were disappointing, though in infants with minimal jaundice at birth, exsanguinating transfusion, though technically difficult, may bring success. If further studies indicate that the Rh-positive infant of a woman who has demonstrable antibodies in her blood is likely to develop haemolytic disease, no matter what the appearance of the infant at birth, exsanguinating transfusion soon after delivery may reduce foetal mortality. As is well known, many infants of normal appearance at birth may in a few hours or days develop the icteric anaemic type of the disease. If this can be predicted, the precious hours between birth and the development of the disease may be well used. Two fatal maternal transfusion accidents are fully presented.

Eardley Holland

434. The Role of the Presumed Serum Protein in the Pathogenesis of Erythroblastosis Fetalis.

By J. Gurevitch, Z. Polishuk, and D. Hermoni. Amer. J. clin. Path., 17, 465-468,

June, 1947. 11 refs.

Anti-Rh sera (with titres of 1 in 256 and 1 in 64 respectively) from two women delivered of erythroblastotic babies—one anti-A serum (1 in 256,000) from a woman with Gaucher's disease, and one anti-B serum (1 in 2,048) from a woman of Group A delivered of a baby of Group B—were examined for agglutinating antibodies in serial dilutions in normal saline. They were also titrated by the conglutination method; the diluent was plasma from an adult of Group AB or compatible sera from normal infants of different ages, or sera from adults with certain liver diseases.

The results showed that sera from umbilical cords and from infants under 6 months did not possess enhancing properties in the agglutinating reaction of the immune antibodies—that is, they acted like saline when used as a diluent—while the sera from infants over 6 months of age, pregnant women, or adults, whether healthy or suffering from hepatic diseases, had the power of enhancing the action of various immune antibodies, thus confirming the observations of Boorman, Dodds, and Morgan (Nature, Lond., 1945, 156, 663).

It is concluded that there is no evidence to support the theory of a serum-factor or X-protein in the pathogenesis of haemolytic disease of the newborn.

Iohn F. Wilkinson

435. A Survey of Commercial Rh Antiserums. By M. G. Levine and R. E. Hoyt. Amer. J. clm. Path., 17, 462-464, June, 1947. 3 refs.

Six different Rh-anti-serums from four different manufacturers were tested on a series of bloods from patients. The results varied from 10 to 100 per cent positive, instead of from the theoretical variation of 85 to 87 per cent. A definite need for standardization and control of Rh diagnostic antiserums is indicated.—[Authors' conclusion.]

436. Variability of the Manifestations of Erythroblastosis. (Over de polymorphie van erythroblastosis foetalis.)

By G. J. Kloosterman. Ned. Tijdschr. Geneesk., 91, 3610-3613, Dec. 13, 1947. 3 refs.

437. Delayed Exhibition of Erythroblastosis Fetalis after Eight Normal Pregnancies.

By T. L. Perry, J. Pediat., 31, 578-579, Nov., 1947. 4 refs.

438. The Undernourished Full-term Infant. A Case Report.

By R. D. McBurney. West. J. Surg., 55, 363-

370, July, 1947.

The author questions the validity of the generally accepted weight standard for prematurity, which the California State Board of Health fixes at 5 lb. 8 oz. (2.48 kg.) or less, and supports his arguments by investigation of the weights of 6,641 babies delivered in the Good Samaritan Hospital at Los Angeles. Of these, 69 babies (1.04 per cent) delivered at term, as calculated from the period of amenorrhoea, weighed 5 lb. 8 oz. (2.48 kg.) or less. The mother's age did not appear to be a factor in producing underweight babies but parity was significant, since 40 of the 69 mothers were primiparae. Five of the patients had mild toxaemia, and the author concludes that toxaemia may interfere with the foetal nutrition. Five of these 69 babies died at delivery or in the neonatal period but none apparently as the result of their small weight, as in each case there was some obvious cause of death; 4 babies showed developmental abnormalities.

The author suggests that these underweight children were suffering from intrauterine malnutrition, probably due to a small placenta, and that if this undernourishment is severe enough it may even cause death before delivery. If the placenta is small, any disturbance in the circulation, such as infarction, may reduce the organ's efficiency below the foetal requirements for full development. Five placentae from underweight infants at term are described: these were somewhat small, but did not show an abnormal degree of infarction.

[In Great Britain the criterion of prematurity until 1938 was an incomplete period of gestation, but in that year a committee of the Royal Colleges of Physicians and of Obstetricians and Gynaecologists recommended a maximal weight standard of 5½ lb., following the example of most European countries; the American Academy of Pediatrics officially recognized the standard of 2,500 g. (just over 5½ lb.) or less in 1935. The author's con-

clusion that "toxaemia" tends to cause underweight babies is certainly not supported by his figures: only 7.5 per cent of these 69 women bearing small children were even mildly toxaemic, and that is less than the general incidence of toxaemia in pregnancy, which is usually accepted as about 10 per cent.]

Margaret Puxon

439. Significance of Protein Hydrolysates in Paediatrics. (Vyznam bilkovinnych hydrolysatů v pediatrii).

By A. Palacky. Cas. lék čes., 86, 838-842 and 862-868, July 11 and 18, 1947. 3 figs., 28 refs.

The author discusses his experience with casein and meat hydrolysates given orally and by intravenous injection in gastro-enteritis of children. Permanent drip infusion was found inadvisable, since the liver should not be forced into unphysiological permanent protein-metabolic activity. There was no difference between the effects of casein and of meat hydrolysates, though casein hydrolysate was considered more valuable for replacing lost nitrogen. The effect of these hydrolysates is discussed under three headings: rehydration, detoxication, and restitution.

In order that the body may retain water given parenterally, the latter must be given together with protein (plasma-infusion) or amino-acids, from which the liver can build the necessary serum albumin. The latter method is better, since it seems easier for the liver to build up serum albumin than to destroy the globulin fraction of the plasma. The weight curve after hydrolysate infusion in 1 case of cerebrospinal fever with otitis is presented. [The author also attempts to show by plasma analysis before and after infusion in 4 cases that amino-acids are actually transformed into protein, but his figures are somewhat inconclusive.]

As casein contains a number of amino-acids (among others methionine) which are not contained in serum albumin, the question of unnecessarily overloading the liver arises. In gastro-enteritis, however, there is no fatty degeneration of the liver but rather a fatty infiltration, fats replacing the metabolized stores of glycogen and proteins. This is a reversible state, as proved by the normal liver function in children after gastro-enteritis. Previously the good effect of acetylcholine in these cases (used originally to combat the paralytic ileus arising sometimes in the later stages) had been noted, and had been attributed to the transformation of fats, through combination with phosphoric acid and choline, into water-soluble lecithin. An equally good effect, both on intestinal peristalsis and on the general condition, can be observed after use of hydrolysates. Since casein contains both phosphorus and methionine (which the body transforms into choline), an effect similar to that due to acetylcholine may be responsible. In such cases the liver cells are undamaged, and start to function normally immediately after the fat has been replaced by protein. In contrast, a case of liver damage with jaundice is described in which the patient went into coma after casein-hydro-

lysate infusion.

The detoxicating effect of the hydrolysates is attributed partly to their influence on acidosis, since amino-acids are ideal buffer substances and it is possible to give the infant large amounts of alkali, and partly to their antihistaminic properties. The latter might be explained either by the simple dilution of histamine, or by the suppression of acidosis (which is necessary for its formation), or by the raised threshold to histamine after amino-acid infusion. However, tests on rabbits injected with histamine and either physiological saline, glucose, or hydrolysates failed to show this detoxicating effect.

In restitution (re-alimentation), hydrolysates have shown themselves distinctly superior to plasma. In cases treated with plasma, complete detoxication and partial rehydration took place, but the patients often died I to 3 weeks afterwards from marasmus. Since the use of hydrolysates such deaths have been extremely rare, and occurred almost exclusively in cases with parenteral infection. The reason for this lies probably in the diffusibility of the amino-acids and in the threonine content of the hydrolysates. Emulsified fat may be added, but this is considered superfluous.

The results of treatment in 53 cases are tabulated: 26 patients were cured and 15 discharged unimproved, while 18 died. Altogether 104 patients were given 326 intravenous and 28 subcutaneous infusions, only 6 receiving the hydrolysates orally. Only in 6 cases of intravenous infusion was there any ill effect—that is, vomiting towards the end of the infusion. There were some remarkable results in cases other than of gastroenteritis, which are briefly mentioned: there was complete cure in 3 cases of erythrodermia desquamativa, 3 cases of acrodynia, and 1 case of pylorospasm, and marked improvement in some cases of seborrhoeic eczema. These results may be partly due to the relations between serum proteins and vitamin B. It is again emphasized that in hepatitis and any case of liver damage hydrolysates are contra-indicated.

A. Rohan

440. Breast-feeding with Special Reference to Social Factors. A Preliminary Report.

By E. J. WILLIAMS. Publ. Hlth. Lond., 60,

201-204, July, 1947. 5 refs.

The rate of decline in the proportion of babies breast-fed has increased in recent years. About 50 per cent of children aged 4 months are weaned from the breast. The majority of doctors are in favour of breast-feeding, but others doubt its advantage, suggesting that it acts as a drain on the mother and curtails her activities for too long a time. This latter opinion is expressed by many mothers. Changed conditions, such as the production of hermetically sealed cans of dried milk with

added vitamins, together with changed social conditions, demand a reconsideration of earlier verdicts on infant feeding. A large number of mothers in all classes are now unable to lead the peaceful domestic existence which should accompany breast feeding.

pany breast-feeding.

The Institute of Social Medicine in Oxford is at present carrying out a survey on the health and sickness experience and the growth and development of children from birth to 5 years of age. The problem of breast-feeding has presented itself early in the course of the investigation. The reasons for the decline of breast-feeding also need investigation. The author considers that some light might be thrown on these two problems if the following questions were answered: (1) Does the duration of breast-feeding show a different incidence in the different social groups? (2) From what age does weaning to solids take place? (3) What are the reasons given by the mothers for ceasing to breast-feed? (4) Does the child weaned early to solids compare favourably with the child kept on a milk diet until 9 months of age? (5) Is the baby fed by modern artificial methods inferior in any way to the breast-fed baby? (6) What are the causes for the decline in breast-feeding?

Answers to questions 1, 2, and 3 are attempted in this paper. Observations have been made on 200 children who had completed their first year of life. Eventually 500 to 600 children will be investigated, representative of every social class in Oxford. The first 200 children have been recruited from the welfare centres in Oxford and from different social groups. It was found that 54 per cent of the children were wholly breast-fed for 5 months or more, and then started mixed feeding. The proportion was ostensibly greater among mothers in the higher than in the lower social grades—67 and 43 per cent respectively—but the observed difference is not statistically significant. There is a suggestion that working-class mothers continue breast-feeding for shorter periods, the average durations being 6.8 months in the highest social group and 4.9 months in the lowest social group. These figures, however, are not statistically significant. The model age period for weaningbabies to solids is between 5 and 7 months, and there is an apparent tendency to start giving solids to bottle-fed babies slightly earlier than to breast-fed babies, although there appears to be no significant difference between the various social groups as regards the beginning of mixed

The exact reasons given by the mothers for abandoning breast-feeding were difficult to ascertain, although "environmental" factors, especially housework, are chiefly responsible. These factors are more important at the present day, when few mothers have domestic help of any kind, and working-class mothers have higher standards of housekeeping and baby care. Success or failure in breast-feeding differs very slightly in the different classes of the population, probably because there

has been an equalization of conditions. All housewives are rationed, all have shopping and home problems, and most are without help in the home. Beryl Bevan

441. Frequent Occurrence of Rickets in Dystrophic Infants. (Uber gehäuftes Vorkommen von Rachitis bei dystrophischen Säuglingen.)

By L. Borcherding. Arch. Kinderheilk., 133,

107-111, 1947. 7 refs.

Present opinion is that dystrophic infants do not suffer from rickets because rickets is supposed to occur only in growing children. In the occasional reports of rickets in such infants either the disease was in its latent form and recognized only in histological sections or the clinical symptoms were mild. The author, however, saw cases of active rickets in a number of dystrophic infants in the Children's Hospital at Lübeck during the later war years. The disease was never severe, but it was not severe either among infants without dystrophy. The diagnosis was made clinically, craniotabes and, in older infants, thickening of the epiphyses being found. Some cases were verified by skiagrams, and in some cases sections were examined.

A table of the cases of rickets occurring between 1942-45 shows that the total number rose from 27 in 1942, 1943, and 1944 to 101 in 1945 and the number in which there was dystrophy from 4 (15 per cent) to 38 (38 per cent). Cases in which rickets existed before dystrophy were not included in the latter group, nor were cases where the infant developed rickets when recovering from dystrophy. The author compares the incidence of rickets in non-dystrophic and dystropic infants in the hospital, and finds that it is approximately the same in both groups. The numbers are, however, too small to be significant. The increase in rickets in dystrophic infants in 1945 could not be related to the increase in the number of premature infants. Most of the 38 dystrophic infants in 1945 were the children of refugees or camp-inmates and only 10 came from normal households. From all 57 dystrophic rickety infants the author selected those with 5 cm. or more retardation of growth, and those who had developed rickets of the thorax in spite of insufficient development of the chest (circumference diminished more than 1 cm). There were 18 in the first group, and 3 in the second

The author concludes from these observations that the view that malnutrition acts as a protection against the development of rickets through a reduction in growth is incorrect. Rickets is a general disease, and the disease process in the area of growth in the bones is only part of the overall picture. Therefore, where growth is abolished or hindered, as in dystrophic infants, the clinical symptoms may be changed through absence of obvious signs in the epiphyses, but these infants can still suffer from rickets.

E. Lejbowicz

442. Maternal and Infant Mortality. A Comparative Study Covering a Period of Twenty Years, based on Records of the Hospital of the Good Samaritan at Los Angeles, California.

By R. H. FAGAN. West. J. Surg., 55, 584-596, Nov., 1947. 4 figs., 6 refs.

443. Pathology of Stillbirths and Neonatal Deaths. A Survey of 1,053 Cases. (Pathologie can doodgehornenen en overleden pasgeborenen [Overzicht van 1,053 gevallen].)

By A. G. Schoo. Maandschr. Kindergeneesk.,

15, 360-362, Oct., 1947.

444. A Note on Stillbirths and Neonatal Deaths. By T. R. RITCHIE. N. Z. med. J., 46, 412-414, Oct., 1947.

# MATERNAL MORBIDITY, MORTALITY.

445. The Obstetrical Cripple. By G. F. ADAM. Texas St. J. Med., 43, 384-

388, Oct., 1947. 12 refs.

446. Obstetric and Gynecologic Mortality at Parkland Hospital, 1944, 1945 and 1946.

By W. F. Mengert, R. J. Rimmer, and M. L. Britton. *Sth. med. J.*, 40, 920-926, Nov., 1947-2 refs.

## OBSTETRIC OPERATIONS

447. Removal of the Pelvis instead of Decapitation. (Depelvisation statt Dekapitation.)

By F. Lichtenstein. Zbl. Gynäk., 69, 141-144,

1947. 1 ref.

448. Historical Development of Willett's Forceps and their Importance in Practical Obstetrics. (Ein Beitrag zur geschichtlichen Entwicklung der Kopfschwartenzange und ihrer Bedeutung für die praktische Geburtshilfe.)

By G. MESTWERDT. Arztl. Wschr., 1/2, 905-912, Sept. 15, 1947. 63 refs.

449. The New Würzburg Forceps. (Die neue Würzburger Kopfzange.)

By C. J. Gauss. Zbl. Gynäk., 69, 321-325, 1947. 1 fig., 1 ref.

450. Caesarean Section. (A propos de l'opération césarienne.)

By H. VERMELIN. Presse Méd., 55, 717-718, Oct. 25, 1947.

451. Extraperitoneal Caesarean Section: Waters Technique. (Cesarea extraperitoneal. Técnica de Waters.)

By J. AMORIM, F. FERREIRA, and J. TAVARES. Obstet. Ginec. lat-amer., 5, 333-343, Aug., 1947-4 figs., 12 refs.

452. An Analysis of 416 Consecutive Caesarean

By C. J. Andrews, R. B. Nicholls, and W. C. Andrews. Amer. J. Obstet. Gynec., 54, 791-800, Nov., 1947.

453. An Analysis of 529 Consecutive Caesarean Sections.

By M. Feresten. J. Mt Sinai Hosp., 14, 280-288, Sept.-Oct., 1947. 7 refs.

454. Cesarean Section in Potentially Infected Patients Using Sulfathiazole in the Uterus and the Peritoneal Cavity.

By J. M. Settle and L. A. Wilson. Amer. J. Obstet. Gynec., 54, 801-803, Nov., 1947. 7 refs.

455. Rectal Dilator in Perineal Repair.

By A. P. Hudgins. W. Virgina med. J., 43, 370-371, Nov., 1947. 4 refs.

#### MISCELLANEOUS.

456. The Evolution of Obstetrics and Gynecology in the Near East.

By W. Bickers. Amer. J. Obstet. Gynec., 54, 814-819, Nov., 1947.

457. The Newcastle-upon-Tyne Obstetric Emergency Service.

By F. STABLER. Brit. med J., 2, 878-880, Nov., 1947.

## GYNAECOLOGY.

General

458. The Incidence of Psychosomatic Disease from a Private Referred Gynecologic Practice.

By F. R. Lock and J. F. Donnelly. Amer. J. Obstet. Gynec., 54, 783-790, Nov., 1947.

459. The Gynecologic Aspect of Headaches.

By E. O. Strassman. J. Mt Sinai Hosp., 14, 646-652, Sept.-Oct., 1947. 3 figs.

460. Extragenital Disease in the Gynecological Patient.

By L. S. LAPID. J. Mt Sinai Hosp., 14, 802-806, Sept.-Oct., 1947.

461. Endocrine Methods of Diagnosis in Gynaecology. (Les méthodes de diagnostic hormonal en gynécologie.)

By C. Beclere. Brux-med., 28, 13-21, Jan. 3, 1948.

#### Disorders of Function

462. Purpura Following Estrogen Therapy, with Particular Reference to Hypersensitivity to (Diethyl) Stilbestrol and with a Note on the possible Relationship of Purpura to Endogenous Estrogens.

By C. J. Watson, A. L. Schultz, and H. M. Wikoff. J. Lab. clin. Med., 32, 606-617, June, 1947. 35 refs.

Five cases in which purpura followed oestrogen therapy are described: 4 were in women suffering from menopausal symptoms or amenorrhoea, and I was in an elderly man with carcinoma of the prostate. To 4 of these patients stilboestrol had been given for 21 to 7 years. The fifth received oestrogens intermittently by mouth for 2 months. Skin tests for a possible sensitivity to oestrone and stilboestrol were carried out on 3 patients, and also on 25 controls. The test consisted in injecting intradermally o.1 ml. of a o.2 per cent suspension in saline. Positive reactions were obtained in the 3 cases studied and were absent from the control group. Circulating antibody could not be demonstrated by the Prausnitz-Kustner passive transfer which was attempted in the 4 cases. The authors nevertheless conclude that the possibility of hypersensitivity to exogenous or endogenous oestrogens may at times constitute the major factor in the production of purpura.

The purpose in reporting these 5 cases is to call attention to the possibility of a causal relation between stilboestrol and other oestrogens and pur-The literature relating to the effects of oestrogens is reviewed and discussed from the standpoint of: (1) reported cases of supposed toxic effects in individuals in whom abnormalities related to the liver and blood were noted; (2) the experimental production of purpura and liver injury in animals by their administration; and (3) the effect of endogenous oestrogens in the production of purpura.

R. Winston Evans

463. Subclinical Hypo-ovarianism.

By J. A. Winter. J. Michigan med. Soc., 46, 1169-1175, Oct., 1947. 2 refs.

464. The Value of the Basal Body Temperature, Vaginal Smear, and Endometrial Biopsy in the Diagnosis of Ovarian Dysfunction. (El valor de la temperature basal del cuerpo, frotis vaginal y biopsia del endometrio en el diagnóstico de los trastornos funcionales del ovario.)

By J. Zanartu Orrego and A. Atria Ramirez. Rev. méd. Chile, 75, 639-647, Oct., 1947. 3 figs., 24 refs.

465. The Effect of Prolapse of the Ovaries Upon Cystic Degeneration and Ovulation.

By J. C. WEED and C. G. COLLINS. West. J.

Surg., 55, 442-450, Aug., 1947. 3 figs., 28 refs.

The subject of prolapse of the ovaries is approached from experimental and clinical aspects. The authors previously (Surgery, 1942, 11, 292) have been able to produce experimentally bilateral polycystic ovaries in rabbits by causing artificial prolapse of the ovaries. Now they have attempted to test for impairment of function in cases of prolapsed ovary. Three months after the opera-

tion, mating with active bucks was encouraged over a period of two weeks. The does were then examined at laparotomy. Out of 8 does, there was only one pregnancy and in the other 7 no fresh corpora lutea from ruptured follicles were found. Further study on these data is in progress. They suggest that " polycystic disease of the ovaries is produced by follicular atresia resulting from persistent vascular congestion, and that follicular atresia is the result of faulty nutrition to the ovum of vesicular follicles." Accordingly 13 patients, ages ranging from 16 to 28, with bilateral polycystic ovaries and with prolapse and pelvic congestion, were treated by ovarian suspension and partial resection. Hypermenorrhoea and polymenorrhoea were the presenting complaints in to cases, with oligomenorrhoea or persistent non-ovular cycles in the remainder. The results were good in 10 cases; one patient was untraced, one result undetermined, and one patient worse (she required oophorectomy for pain). Six patients had had previous endocrine treatment. From this and the experimental data the authors conclude that polycystic disease of the ovaries is not due to hormone imbalance.

[All cases were stated to have an oestrin-phase endometrial pattern. Surely the day of the cycle in which this observation is made should be

recorded.]

Magnus Haines

466. Hyperestrinism in Private Practice. By R. T. Spicer. Amer. J. Obstet. Gynec., 54, 809-813, Nov., 1947.

467. Hypertrophy of the Endometrium.

By H. F. TRAUT, A. B. SCOVILLE, and A. KUDER, J. Mt Sinai Hosp., 14, 659-670, Sept-Oet., 1947. 4 figs., 18 refs.

468. Hypothyroidism in Functional Gynecologic Disorders: Withdrawal of Thyroid Medication as a Diagnostic Aid.

By B. Bergias, J. Mt Sinai Hosp., 14, 743-746, Sept.-Oct., 1947. 14 refs.

469. The Use of Estrogen.

By T. L. Montgomery. Ohio St. med. J., 43, 1046, Oct., 1947.

470. The Limitations of Endocrine Therapy in Menstrual Disorders.

By I. A. WIJSENBEEK. J. Mt Sinai Hosp., 14, 215-221, Sept.-Oct., 1947.

471. Efficacy of Follidrin Tablets and some other Oestrogens by Various Routes. (Experimentella undersökningar över verkningsstyrkan av follidrintabletter och nagra andra östrogener vid olika administrationssätt.)

By S. Wiedling. Nord. Med., 36, 2459-2462, Dec. 5, 1947. 20 refs.

472. The Syndrome of Premenstrual Tension. (El sindrome de tension premenstrual.)

By R. DEL V. Y. Adaro and J. M. San Angonio. Toko-ginec. pract., 6, 334-341, Nov., 1947.

473. The Psychosomatic Aspect of Dysmenorrhea. A Sensory Conditioning Process.

By W. E. HUNTER and B. B. ROLF. Amer. J. Obstet. Gynec., 53, 123-131, Jan., 1947. 2 figs., 22 refs.

The authors seek to demonstrate the mechanism of increased sensibility in dysmenorrhoea by discussing the normal physiology of the menstrual cycle, the changes of which become exaggerated by sensory conditioning and integration to form psychic patterns in the cerebral cortex producing pain and other disagreeable symptoms. They endeavour to show that such symptoms are not imagined but have a physiological basis.

Dysmenorrhoca is classed as primary or functional, and secondary or organie. Contributing factors are sex-consciousness, emotional conflict, and lowered pain threshold. Patients universally admitted emotional or nervous instability and one or more physical symptoms. Dysmenorrhoca occurs in normal healthy ovulating women with no hormone imbalance, and in whom the cycle is regular and accompanied by formation of secretory endometrium. The accepted theories of the pain mechanism are reviewed. It is pointed out that, although childbirth and age accentuate local uterine changes, dysmenorrhoca when untreated diminishes when these changes become more noticeable.

Lewis is quoted as saying that " pain eannot be defined as it is something we learn from experience and describe by illustration ". The normal level at which pain is appreciated is the cortex, the phantom limb being an apt example. Experiments concerning pain perception are reviewed. Pain threshold has been shown to be elevated 30 per cent by placebos, depending on the confidence of the patient in the remedy. Details of cases are given to illustrate the value of suggestion aided by hypnosis and partial anaesthesia by thiopentone (" pentothal "). Moliminal symptoms are due to corpus luteum activity, and can be relieved by sodium restriction, chloride administration, and temporary suppression of ovulation by stilboestrol. Both surgical and medical means relieve, as also do placebos, suggestion under hypnosis, or narcosuggestion. Suggestion either consciously or unconsciously enters into the treatment of most cases of C. W. Kimbell dysmenorrhoea.

474. Treatment of Primary Dysmenorrhoea by Dilatation of the Cervix and by Sympathectomy (Postoperative Examination of 195 patients). (Primar dysmenorrhoea behandlet med dilatasjon av cervix uteri og med sympatektomi. En etterundersøkelse av 195 pasienter.)

By K. Knutsen. Nord. Med., 22, 1261-1268,

May 30, 1947. 33 refs.

At a gynaecological and maternity hospital in Bergen cases of primary dysmenorrhoea are usually treated by dilatation of the cervix. When this fails, or when the dysmenorrhoea is associated with sterility or with certain complications, such as retroversion of the uterus, in need of treatment, resection of the hypogastric sympathetic plexus (presacral nerve) is undertaken. On the basis of 195 cases treated in the five-year period 1941-45 the author concludes that dilatation of the cervix with Lövset's dilator is not dangerous, and ensures complete recovery or definite improvement in about 50 per cent. Nerve resection entails the same risks as any other operation involving laparotomy, and it should therefore be reserved for cases of primary dysmenorrhoea refractory to more conservative measures, such as dilatation of the cervix. In 75 cases in which resection was undertaken 87 per cent were improved; this improvement ranged from complete freedom from symptoms to definite amelioration with fitness for work. Backache was often not relieved by resection, the efficiency of which should be tested by a histological examination of the tissues resected. The demonstration of a few nerve elements is no guarantee of an adequate resection, which, to be successful, must include all the nerve fibres of the hypogastric plexus. Failure to demonstrate nerve elements in the resected tissues is an indication for re-operation. Resection seems to have no unfavourable effect on pregnancy or labour, and in many cases subsequent labours are comparatively painless. This operation seems not to influence frigidity, but in many cases it may facilitate coitus.

C. Lillingston

475. Treatment of Essential Dysmenorrhoea with Ephedrine. (Behandling af essential Dysmenorrhoea med Ephedrin.)

By J. U. Schlegel. Nord. Med , 34, 1153-1156,

May 16, 1947. 31 refs.

Explaining the use of ephedrine in the treatment of dysmenorrhoea, the writer refers to his own theory of menstruation (Nord. Med., 1944, 24, 2057), according to which the number of arteriovenous anastomoses in the endometrium is greatly increased immediately before menstruation, and the latter is induced by the ischaemia resulting from the flow of blood through these anastomoses instead of through the capillaries. Going a step further, the author suggests that the dilatation of these anastomoses may deprive the myometrium as well as part of the endometrium of blood, and that it is the ischaemia of the myometrium that gives rise to pain. Ephedrine, by constricting the anastomoses, diverts the blood into the myometrium and eliminates pain. The author reports on 23 cases treated in this way. In 17 the pain disappeared completely and the ephedrine caused no subjective discomfort. In 2 the pain disappeared but the patients complained of headaches, nausea, and palpitations. In 4 the pain was not eliminated and there was considerable subjective discomfort.

B. Nordin

476. Stimulating X-ray Doses in Amenorrhoea and Oligomenorrhoea. (Dosis estimulantes de rayos X en amenorrea y oligomenorrea.)

By L. FIERRO DEL RIO and J. M. FARIAS RODRIGUEZ. Rev. méd. Hosp. gen., 9, 355-361, Feb., 1947. 32 refs.

Small doses of X-rays have been used in endocrine disturbances with diminished function, in the belief that cellular activity is stimulated by the products of tissue destruction, called "necrohormones", resulting from the passage of the X-rays. The value of stimulating doses of X-rays in menstrual disorders has been disputed. While many authors speak enthusiastically of them, others consider that they are useless and dangerous and produce glandular destruction.

The authors describe a series of cases which they have treated and observed over 3 years. patents had a gynaecological and general examination. The technique used was a modified form of Mazer's. The physical factors involved are: 135 kV., 3 mA., filtration with 5 mm. of aluminium or its equivalent, and a focal skin distance of 40 cm. Two pelvic fields of 20 by 24 cm. and two temporal fields of 4 by 4 cm. are used. The total dosage consists of 405 r measured in air; of these 90 are administered by the anterior and 45 by the posterior pelvic routes, and 135 in each of the temporal fields. Three weekly treatments are given, with three applications in each session. In the first and third weeks the anterior pelvic field and both temporal fields are irradiated, and in the second the posterior pelvic field and both temporal fields.

Three patients without menstrual disturbances were treated. Two had pre-menstrual tension and both were relieved. Twelve patients with amenorrhoea and oligomenorrhoea were treated. In all, the disturbance was functional and none had any organic change apart from genital infantilism. In 10 of these the normal menstrual cycle was reestablished. Six pregnancies followed, I patient becoming pregnant twice, and 5 of these went to term or were progressing normally. Finally, in 2 other patients with organic lesions there was no change after treatment.

The authors' results are similar to those reported in the literature, which they quote in detail. No serious effects have been produced on the patients or the babies, and it is not considered that there is any risk to future generations. Care must be taken over the dosage, however, and that used has been one-half or one-third of that recommended by other authors. Great care must also be taken, because of the injurious effect of radiation on the foetus, to avoid treatment in any patient who may be pregnant. The treatment therefore should be given only in the first 15 days after a menstrual period.

Bryan Williams

477. A Discussion of the Treatment of Functional Dysmenorrhea and a Hormal Test for Endometriosis.

By J. M. Freiheit. Connecticut med. I., 11, 965-972, Dec., 1947. 16 refs.

478. Presacral Neurectomy in Intractable Dysmenorrhea.

By L. E. PHANEUF. J. Mt Sinai Hosp., 14, 553-555, Sept.-Oct., 1947. 3 refs.

479. Results of Treatment of Primary and Secondary Amenorrhoea and of Oligomenorrhoea with Gonadotrophic Hormone from Pregnant Mare's Serum. (Resultaten de behandeling van primaire en secundaire amenorrhoe en van oligomenorrhoe met gonadotroop hormon verkregen uit serum van drachtige merries [Gestyl].)

By A. J. M. Duyzings. Ned. Tijdschr. Geneesk., 91, 3598-3603, Dec. 13, 1947.

480. Histological Entities in functional Uterine Haemorrhage and their Treatment. (Les entités histologiques des hémorragies utérines fonctionnelles et leurs traitements.)

By J. L. Wodon and R. Cordier. Rev. franc. Gynéc. Obstét., 42, 161-174, May, 1947. 4 figs.,

13 refs.

This article deals only with functional uterine haemorrhage, excluding haemorrhage due to causes such as tumour. A premenstrual biopsy was performed—sometimes two biopsies at intervals when the exact date of menstruation is not available. Haemorrhages are classified as: (a) Those associated with the period of endometrial proliferation; these are: cystic glandular hyperplasia (metropathia haemorrhagica), polypoid hyperplasia, intrauterine endometriosis, and decidual hypertrophy of the corium. These are clinically metrorrhagias. (b) Those due to regression of the endometrium: endometrial hypoplasia, menorrhagia with excessive exfoliation, membranous dysmenorrhoea. These are clinically menorrhagias. The authors classify their findings as follows.

			Per	cent
Debris of ovulation	•••	•••	•••	3
Chronic metritis	•••	•••	•••	6
Cystic glandular hypertroph	y		•••	26
Polypoid hyperplasia	•••	•••	•••	8
Intrauterine endometriosis	•••	• • •	•••	3
Deciduiform hypertrophy	•••	•••	•••	5
Hypoplasia of endometrium	• • •	• • •	•••	16
Normal histology	•••	•••	•••	26
,, (blood lesi	ion)			1
Histology unclassifiable	•••	• • •		6

Of the cases of menorrhagia—that is, cyclic bleeding, which may be profuse or persistent—26 per cent show no histological lesion, the lesion appearing only at the moment of menstrual haemorrhage A biopsy performed during the course of menstruation will disclose an abnormal histology with modification of the endometrial No further evidence of this desquamation. interesting suggestion is offered.] The metrorrhagias are accompanied by alterations in the phase of growth of the endometrium, while the menorrhagias are accompanied by alterations in the phase of regression and exfoliation of the endometrium.

The existence of chronic metritis is doubted by many; the present authors state that it does occur, but only when maintained by a primary tubal infection. The presence of polymorphonuclear infiltration is not a sign of inflammation of the endometrium, and may in fact he a normal appearance. The rarity of this disease is due to the spontaneous cure which occurs by the shedding of any damaged endometrium each month. In chronic metritis there is a characteristic heavy plasmatocyte infiltration of the endometrium. Hypoplasia is regarded as being due to an endometrium incapable of growth—as, for example, at the menopause; therefore, although oestrogen may cure, the condition will relapse as soon as the hormone is stopped.

Treatment may consist either of curettage followed by radium, or of hormone therapy-for example, with gonadotrophin daily for 6 to 7 weeks. [The success claimed for the latter form of treatment is not confirmed by British and Testosterone is not American experience. effective, since the bleeding starts again when treatment ceases. The authors claim cure rates by curettage of 40 per cent in women under 40 and of 60 per cent in women over 40. Permanent cure is obtained in the remainder by 1,000 mg.

hours of radium.

[This article is marred by the poor quality of the photomicrographs. It would have been interesting to see an illustration of the specimens taken Bernard Sandler during menstruation.]

481. The Treatment of Metropathia Haemorrhagica with Male Sex Hormone.

By P. G. SHUSHANIYA. Akush. Ginec., No. 2,

31-32, 1947.

Metropathia haemorrhagica is due, according to the author, to persistence of a Graafian follicle, which does not rupture and thus supersaturates the organism with its secretion. Treatment may be hormonal (administration of progesterone or prolan) or surgical (curettage or destruction of the offending follicle). Male sex hormone ("testoviron ") was implanted subcutaneously or given by mouth (dose not stated) to 11 patients suffering from metropathia haemorrhagica. In all cases the haemorrhage rapidly subsided (the longest period was 6 days from the beginning of administration of the male sex hormone). The author concludes that this is the treatment of choice in metropathia haemorrhagica.

Nicolas Tereshchenko

482. Functional Bleeding.

By A. H. Curtis. J. Amer. med. Ass., 135, 560-561, Nov. 1, 1947. 1 ref.

483. Uterography as an Aid in the Diagnosis of Uterine Bleeding.

By S. A. Robins. *J. Mt Sinai Hosp.*, 14, 559-568, Sept.-Oct., 1947. 10 figs., 13 refs.

484. Radium Therapy in Benign Uterine Bleeding. By A. J. Rongy. J. Mt Sinai Hosp., 14, 569-575, Sept.-Oct., 1947.

485. Haemorrhage of the Corpus Luteum Simulating Acute Appendicitis. (Hemorragias do corpo amarelo simulando apendicite aguda.)

By L. M. MACHADO. Rev. Ginec. Obstet., 2, 760-764, Oct., 1947. 6 refs.

486. Menorrhagias of Puberty. (Menorragias de la pubertad.)

By A. Pedro-Pons. *Med. clin.*, 9, 213-218, Oct., 1947. 8 refs.

487. Immediate and Late Results of X-ray and Radium Therapy in Benign Menorrhagia and Metrorrhagia. (Esiti immediati e a distanza nella roentgene radiumterapia delle forme menometrorragiche benigne.)

By P. Alfieri. Ginecologia, Torino, 13, 401-429, Sept., 1947. Bibliography.

488. Menometrorrhagia during Adolescence.

By C. F. Fluhmann. J. Amer. med. Ass., 135, 557-560, Nov. 1, 1947. 2 figs., 18 refs.

489. Vitamin B Complex, Menorrhagia, and Cancer. A Critical Review.

By R. R. GREENE and B. M. PECKHAM., Amer. J. Obstet. Gynec., 54, 611-617, Oct., 1947. 46 refs.

490. Substitutes for Progesterone in the Production of Deciduomata. (Die Ersetzbarkeit van Progesteron bei der Erzeugung von Deziduomen.)

By K. Richter. Wien. med. Wschr., 97,

281-284, June 21, 1947. 1 fig., 17 refs.

Various substances are used nowadays in gynaecology for their supposed progesterone-like action. The efficacy of some of these in producing deciduomata formation has been investigated by the author. He chose deciduomata formation as the one reliable means of testing progesterone-like activity, owing to the known variability of response of different test animals under similar experimental conditions.

Castrated albino rats 19 days old, of a special breed, and of an average weight of 400 g., were used. Five days after castration and for the succeeding 5 days 100 units "folipex" (follicular hormone) was injected daily. The substance to be investigated was given during the following 9 days. On the third day of this period a laparotomy was performed and the uterus traumatized by a silk thread drawn through one of its horns. The rat was killed on the ninth day, and the uterus extir-

pated and fixed in alcohol. A careful comparison was made of the response of the traumatized area in the uterus to the test substances. Several rats were injected with varying amounts up to 9 mg. progesterone to obtain a deciduoma to compare wth those produced by the test substances. Desoxycorticosterone acetate, 150 mg., produced a deciduoma comparable with that obtained with 9 mg. progesterone; it can therefore be said that the suprarenal hormone has a progestational effect. Testosterone propionate 120 mg., synthetic vitamin E (a-tocopherol) 4,500 mg., and 900,000 units of prolactin were insufficient to produce deciduoinata formation. The amounts of these substances could scarcely be exceeded. Hence it may be said that these substances have no progestational effect. Further, the therapeutic efficacy of these latter substances in gynaecological disorders, such as metropathia, can be due only to their effect on either the ovarian follicle or the anterior pituitary Gladys Dodds gland.

491. Oral Smears Compared with Vaginal Smears. Case Report.

By P. B. Russell. Sth. med J., 40, 561-563,

July, 1947. 2 figs., 4 refs.

This is a case report to illustrate the value of Russell and Bennett's method in controlling the synthetic oestrogen therapy of menopausal symptoms in a woman of 44, following surgical operation. Gram-stained smears from the surface of the mouth show the influence of hormonal stimulation on the buccal epithelium, and permanent preparations can be made for comparison. It is suggested that the method is applicable to the oestrogen therapy of vulvo-vaginitis in children, and that the patients themselves could prepare the smears.

E. T. Ruston

492. Post-menopausal Genital Bleeding.

By J. K. FEENEY. J. med. Ass. Eire, 20,

260-263, May, 1947. 4 refs.

Post-menopausal genital bleeding was investigated in 100 consecutive cases. Lesions of the bladder and urethra are included. Post-menopausal bleeding is taken as meaning haemorrhage occurring not less than 18 months after cessation of the last menstrual period.

Of the 100 cases investigated, 42 were due to malignant disease—a lower figure than that given by American authors, who found that the percentage of malignant disease varied between 50 and 70. Of the 42 cases due to malignant disease, the uterus was the site of the neoplasm in 35 (carcinoma of body, 18; carcinoma of cervix, 15; sarcoma of body, 2). Malignant disease of the ovary was found in 4 cases (carcinoma, 2; malignant granulosa-cell tumour, 1; malignant dysgerminoma, 1). There were 1 carcinoma of Bartholin's gland, 1 squamous epithelioma of the vulva, and 1 malignant ulcer of bladder.

Fourteen groups of cases of post-menopausal haemorrhage due to non-malignant causes are

described, and short clinical notes are presented for each group. Endometrial bleeding followed administration of stilboestrol in 12 cases; this drug is often incorrectly prescribed, in that it is given in excess, used over too long a period, and used in unsuitable cases. It is noteworthy that ulceration of the cervix in prolapse was responsible for 10 cases, and ulceration due to a pessary for 6. One case of bleeding was due to syphilitic ulceration of the cervix.

A full investigation of all cases of postmenopausal bleeding is advised, even when a single obvious cause is present, such as a vascular caruncle or haemorrhagic erosion. Such investigation should include a general physical examination, examination of the urine, with cystoscopy and urography in certain cases, rectal and bimanual examination, diagnostic cervical biopsy in all doubtful cases, and routine microscopical examination of all polypi. author advises practitioners to refer all cases of post-menopausal bleeding for immediate investigation. The seriousness of delay is emphasized in this series by the fact that, in the cases of malignant disease affecting the uterine body and cervix, the average duration of bleeding before consultation was 10 months. E. L. Nicolson

493. The Premenopausal Syndrome and its treatment with Hormones. (Du syndrome préménopausique et de sa thérapeutique hormonale.)

By H. DE WATTEVILLE. Brux.-méd., 27, 2553-2562, Nov. 23, 1947. 19 refs.

494. A Critical Survey of the Use of the Estrogens in the Treatment of the Menopausal Syndrome.

By H. H. Brainard. Amer. Practit., Phila., 2, 82-84, Oct., 1947. 7 refs.

495. Bleeding Associated with the Menopause. By J. P. Pratt. J. Amer. med. Ass., 135, 562-564, Nov. 1, 1947.

496. The Radiological Features of the Sella Turcica in So-called Menopausal Metropathia. (Sull'aspetto radiologico sellare nella cosi' detta metropatia della menopausa.)

By W. INGUILLA. Monit. Ostet.-Ginec., 18, 29-38, Jan.-June, 1947. 8 figs., 9 refs.

497. Hymeno-vestibulitis: A Frequent but Little Recognized Cause of Dyspareunia. (Hymenovestibulitis localis, een frequente maar niet herkende oorzaak van dyspareunie.)

By J. G. H. Holt. Ned. Tijdschr. Geneesk., 91, 3613-3616, Dec. 13, 1947. 2 figs.

498. The Office Study of Infertility.

By I. M. PROCTER and K. DICKINSON. Amer. J. Obstet. Gynec., 53, 65-74, Jan., 1947.

A study was made of fertility in 210 women, 49 of whom had had a previous pregnancy, which had resulted in the birth of 11 living children, 30 abortions (3 induced), 5 stillbirths, and 3 tubal

pregnancies. The greatest desire for pregnancy came in those aged 25 to 30. The long-standing untreated case of sterility gave the worst results. No case was considered unless contraception had not been practised for I year previously. Of those who became pregnant, I gave a history of gonorrhoea and 13 of mumps. No patient with a history of ruptured appendix became pregnant, nor in any of the 14 patients who had previously worn a stem pessary did pregnancy occur before or after investigation and treatment. In 103 cases tested the vaginal secretions were acid, and in 101 cases where the pH of the cervical canal was estimated 52 were alkaline and 49 acid, but this finding did not seem of significance in those becoming pregnant. Cervical infection and erosion did not appear to make any appreciable difference. There were 66 cases of cervical erosion and 46 cases of deepseated cervicitis, 3 with impassable strictures. A further II cases had laceration of the cervix and infection, making a total of 59 per cent of cases with cervical pathology. Vaginal pathology such as Trichomonas vaginitis and fungous vaginitis was noted in 9 cases. Retroflexed uterus was present in 20 per cent of patients; the authors consider that this represents approximately the incidence amongst all women. It was noted, however, that of the patients becoming pregnant only 11 per cent had retroflexion, pregnancy being thus half as frequent in these women as in the general female population. The effect of faulty position of tubes and ovaries could not be evaluated.

The authors agree with Meaker and Siegler that the study of sterility is the study of infertile matings. In this series the male was only indirectly considered. In 104 Huhner sperm tests the result was abnormal in 56. The condoin-bottle sperm test was abnormal in 61 cases in 123. Of those women in whom pregnancy resulted, 65 per cent of the husbands had normal sperm, compared with 44 per cent of the husbands of women in whom no pregnancy resulted. The Rubin test was performed 306 times on 193 women, tubal patency being demonstrated at the first attempt in 67 per cent of those who became pregnant and 68 per cent of those who did not. In 2 patients insufflated seven times each, 1 became pregnant. "Lipiodol" studies were made seventeen times only, patency being found in 4 out of 5 patients becoming pregnant. In I case three insufflations and one salpingography were negative but pregnancy occurred. Of the 12 cases in which no pregnancy ensued there was occlusion in 6.

Endocrine stigmata were present in 61 per cent. The basal metabolic rate was determined in 125 cases; in 74 the rate was normal, and in 46 below normal. Thyroid extract was given to 61 women, 36 per cent of whom became pregnant. The authors feel that thyroid extract has a most helpful therapeutic effect. The effect of oestrogens, progesterone, and gouadotrophins could not be evaluated. The effect of vitamin E, used in 18 cases, was also difficult to evaluate.

In 210 cases 73 pregnancies ensued (35 per cent); 9 pregnancies terminated as abortions, and there was 1 tubal pregnancy. The authors find that 1 of 4 infertile women will produce normal viable offspring. After a long period of infertility results are less successful.

C. W. Kumbell

499. Some Aspects of Human Infertility.

By A. SHARMAN. Brit. med. J., 2, 83-87,

July 19, 1947. 11 refs.

The author discusses his experience in the diagnosis of patency and non-patency of the tubes, the therapeutic aspects of insufflation, tuberculous endometritis and primary sterility, and the causation of tubal occlusion. Insufflation of the tubes was carried out on 1,478 patients, of whom some 400 had 2 or more tests, 22 had 6 or more tests, while I patient had 23. Another had 18 daily tests between the cessation of one period and the beginning of the next. It was concluded that: (a) a single finding of non-patency is not reliable—in 57 consecutive cases with this finding only 18 proved in fact to have blocked tubes; (b) a reliable standard for non-patency is 2 negative insufflations and I negative hysterosalpingogram—non-patency in almost 1,000 cases was 20 per cent; (c) greater accuracy would be probable if 250 mm. Hg were accepted as the upper limit of pressure in the test rather than 200 mm. Hg.

Of 902 patients traced (primary sterility only) 271 (30 per cent) became pregnant. Of 259 of these, 69 (27 per cent) became pregnant within 3 months of insufflation, 108 (42 per cent) within 6 months, and 47 (31 per cent) within 1 year. Endometrial examination in 1,898 cases of primary sterility showed unsuspected tuberculosis in 100 (5.3 per cent). Further analysis has shown endometrial tuberculosis to be fifteen times more common in sterile than in fertile women. Chronic endometritis in a case of primary sterility should be regarded as suggestive of tuberculous infection. Re-infection (tuberculous) recurs rapidly after curettage. Removal of tuberculous Fallopian tubes does not cure endometrial infection. In cases of endometrial and tubal tuberculosis restoration of fertility is almost hopeless. There is a high incidence (61.8) per cent) of non-patency of tubes in endometrial tuberculosis, probably due to unsuspected subclinical tuberculous salpingitis. The aetiology of tubal occlusion is discussed at length.

Anthony W. Purdie

500. Chromoperitoneoscopy in the Investigation of Tubal Patency. (Cromo-peritoneoscopia. [Visualização da permeabilidade tubária.])

By L. D. DUTRA. An. brasil. Ginec., 12, 52-55,

July, 1947.

This is a study of peritoneoscopy in the investigation of tubal patency. While the operator focuses the peritoneoscope upon the tubal ostium, an assistant, using a hysterosalpingography apparatus, injects slowly into the cervix a 2.5 per

cent methylen: blue solution. If the tube is patent the dye will pass through the abdominal ostium visible. The efficacity of this method has been checked by hysterosalpingography. The author recommends it as a valuable aid in the diagnosis of sterility.

A. Lilker

501. An Historical Review of Sterility.

By W. P. Tew. J. Mt Sinai Hosp., 14, 208-214, Sept.-Oct., 1947. 6 refs.

502. Sterility.

By R. A. Moon. J. Kansas med. Soc., 48, 496-501, Nov., 1947. 2 figs., 17 refs.

503. Sterility. Personal Observations.

By R. T. FERGUSON. J. Mt Sinai Hosp., 14, 289-292, Sept.-Oct., 1947. I fig., 6 refs.

504. Some Aspects of Female Infertility.

By L. LLOYD-GREEN. Med. J. Aust., 1, 7-12, Jan. 3, 1948. 43 refs.

505. Periodical Fertility and Infertility in the Female. (Die periodische Fruchbarkeit und Unfruchtbarkeit der Frau.)

By T. Antoine. Wien. klin. Wschr., 59, 725-728, Nov. 7, 1947. 51 refs.

506. The Diagnosis and Management of Sterility in the Female.

By R. E. NICODEMUS, LeR. F. RITMILIER, and I. L. MESSMORE. *Penn. med. J.*, 51, 54-57, Oct., 1947. 3 refs.

507. Contributary Factors in Female Sterility. (Algunos aspectos parciales de la esterilidad femenina.)

By P. DE LA PENA REGIDOR. Toko-ginec. pract., 6, 313-330, Nov., 1947. 5 figs., 12 refs.

508. Does Backward Displacement of the Uterus Cause Sterility?

By B. SOLOMONS. J. Mt Sinai Hosp., 14. 204-207, Sept.-Oct., 1947. 4 figs., 1 ref.

509. A Study of Seventy Successfully Treated Cases of Sterility.

By J. Kotz and M. S. Kaufman. J. Mt Sinai Hosp., 14, 463-466, Sept.-Oct., 1947.

510. Gonadotrophic Hormones in the Treatment of Ovarian Insufficiency and Sterility. (Die gonadotropen Hormone in der Behandlung der ovariellen Insuffizienz und der Sterilität.)

By E. RYDBERG. Bull. schweiz. Akad. med. Wiss., 3, 178-181, Dec., 1947.

511. The Rubin Test. Utero-tubal Insufflation, Its Origin and Scope.

By S. Wimpheimer. *J. Mt Sinai Hosp.*, 14, 712–720, Sept.–Oct., 1947. 5 figs., 9 refs.

512. Contribution to the Study of Tubal Patency by Kymographic Insufflation.

By L. Bonnet. J. Mt Sinai Hosp., 14, 141-151, Sept.-Oct., 1947. 6 figs., 10 refs.

513. Present Status of Hysterosalpingography. By A. J. Bendick. J. Mt Sinai Hosp., 14, 739-742, Sept.-Oct., 1947.

514. Hysterosalpinography in the Treatment of Sterility in the Female.

By C. L. MARTIN and J. J. SAYAMA. *Texas St. J. Med.*, 43, 389-393, Oct., 1947. 5 figs., 26 refs.

515. The Method of Zondek, Courrier, et al. in Sterility. (Amenorrhoe-methode van Zondek en Courrier en Medewerkers, toegepast bij steriliteit.)

By L. W. A. M. BAER. Ned. Tijdschr. Geneesk., 91, 3644-3647, Dec. 13, 1947. 2 refs.

516. Influence of Arginine on Oligospermia.

By H. S. GUTERMAN. Proc. Soc. exp. Biol.,

N.Y., 65, 176-178, June, 1947. 2 refs.

(1) Eighteen infertile men with oligospermia received 1.8 to 2.7 g. of arginine and minimal amounts of lysine, pyridoxine, and tryptopliane in tablet form for 8 months. (2) The tendency for sperm concentration to increase was as great in the untreated group as in the treated groups. (3) Although no pregnancies occurred in the treated groups, 2 pregnancies were recorded among the wives of 2 of the control subjects. (4) It appears that amino-acid therapy for oligospermia should be reserved for those patients who exhibit or give the history of inadequate protein intake.—[Author's summary.]

517. Successful Artificial Insemination after the Addition of Hyaluronidase to Semen. Chemical Problem of the Glucides in Cervical Secretion. (Fécondation artificielle réussie après adjonction d'hyaluronidase au liquide spermatique. Problème chimique des glucides de la sécrétion cervicale.)

By F. Moricard. Gynéc. Obstét., 45, 781-783,

1946. 5 refs.

This is an account of 3 cases of sterility (2 primary) in which artificial insemination aided by hyaluronidase was attempted. In 2 cases it failed. In the third, the patient, aged 30, had been married for 8 years, during 5 of which her husband had been a prisoner of war. Clinical examination, study of endometrial pattern, and insufflation gave normal results. A post-coital test showed oligospermia and asthenospermia. The spermatic fluid showed some non-motile forms, spermatocytes, and spermatids. The husband was treated with gonadotrophins, testosterone, and vitamin E. Improvements were noted in the spermatic fluid from March to June, 1946, which were attributed to improved dietary conditions. Artificial insemination was attempted several times. May, 1946, the sperm count was greatly increased, with about 40 per cent. motile forms.

Hyaluronidase was added to the seminal fluid on June 23, and a sample of the fluid was brought in a Petri dish (about an hour's delay). Examination showed numerous sperms with 50 per cent motility. To 3 ml. of the seminal fluid was added 10 mg. hyaluronidase, which seemed to accelerate the movement of the sperms; 1 ml. of the mixture was injected slowly and gently into the external os of the cervix. There was a slight reflux into the vagina. The patient remained in the lithotomy position for 20 minutes. In September, 1946, the patient was found to be 3 months pregnant.

A short review of the literature is given under two headings: (1) enzyme problems of fertility, and (2) factors in the ascent of spermatozoa in the cervical secretion. It is concluded that enzymes in the seminal fluid, and particularly hyaluronidase, play an important part in aiding the ascent of spermatozoa in the cervical fluid, which has a high glucide content.

[The paper lacks figures for the sperm count. Further cases of "hyaluronidase fertility" are awaited, but they are among the most difficult to assess. The quantity of enzyme used is measured empirically.]

Magnus Haines

518. The Suggested Culpability of Co-operation by the Physician in Artificial Insemination. (Die angebliche Strafbarkeit der Mitwirkung bei kunstlicher Befruchtung.)

By —. Weigrlin. Zbl. Gynäk., 69, 400-402.

947

519. The Effect of War on Male Fertility. By C. COGHLAN. J. Mt Sinai Hosp., 14, 167-169, Sept.-Oct., 1947.

# Abnormalities of the Reproductive Organs

520. Diagnostic and Surgical Problems Encountered in some Malformations of the Female Reproductive System.

By M. D. Schnall. J. Mt Sinai Hosp., 14, 812-820, Sept.-Oct., 1947. 4 figs. 35 refs.

521. Congenital Absence of the Vagina with a Functioning Uterus.

By D. O. FERRIS and R. SAMPER. Proc. Mayo Clin., 22, 198-204, May 14, 1947. 3 figs., 10 refs.

The first case of congenital absence of the vagina is reported in which a new vagina has been constructed and successfully connected with a functioning uterus without resorting to abdominal exploration, the use of skin grafts or of skin from the labia.

A 14-year-old girl complained of amenorrhoea, abdominal pain at the times when her twin sister menstruated, and a mass in the lower abdomen. Examination revealed absence of vagina and a pelvic mass 14×18 cm., which felt like a uterus distended with fluid. At operation dissection was carried out between urethra and rectum and continued upwards until the uterine mass presented. A thickened portion, presumed to be cervix, was incised and a quantity of old tarry blood evacuated from the uterine cavity. A glass tube was sutured into the cervix for I week, after which it was

removed and a hollow lucite vaginal mould introduced, bearing a tubular projection 3.2×7 cm. at its upper end. This projection was passed into the cervical canal and held in place by a small flange at its distal end. One month after operation the patient had her first menstrual period. At this time the cervix and vaginal wall appeared entirely normal. Menstruation has continued regularly for almost a year since operation. She continued to wear the mould for 10 months of this time [but it is not stated whether the instrument has now been discarded].

S. S. B. Gilder

522. Independent Kinetic Function of the Two Horns of a Uterus Didelphys. (Sulla indipendenza funzionale cinetica dei due corni di utero didelfo.)

By G. Colucci. Ginecologia, Tormo, 13, 391-397, Aug., 1947. 2 figs., 10 refs.

523. Imperforate Hymen Resulting in Hydrometrocolpos and Hematocolpos.

By J. S. LEOPOLD. J. Mt Sinai Hosp., 14, 467-469, Sept.-Oct., 1947. 4 refs.

#### Infectious of the Reproductive Organs

524. Prophylaxis of Infection after Gynaecological Operations and during Radium Therapy. (Sul trattamento profilattico delle infezioni operatorie ginecologiche e delle infezioni in corso di radiumterapie.)

By G. VALLE. Ginecologia, Torino, 13, 353-366,

Aug., 1947. 19 refs.

525. Use of Penicillin in Gynaecology.

By I. E. GLAZ. Akush. Ginec., No. 5, 54-55, 1947.

526. Study of a New Species of Anaerobic Neisseria Isolated from a Case of Vulvo-vaginitis: N. vulvo vaginitis. (Etude d'une nouvelle espèce de Neisseria anaërobie isolée d'une vulvovaginite: N. vulvo-vaginitis.)

By V. REYNES. Ann. Inst. Pasteur, 73, 601-602,

June, 1947.

A new anaerobic form of Neisseria, which could not be identified as belonging to any of the hitherto described types, was found in association with Streptococcus lanceolatus in the pus from a case of vulvovaginitis in a 5-year-old girl. A brief description is given of the morphology, physiology, and cultural and biochemical characteristics of the organism; the latter was found to be nonpathogenic for mice and guinea-pigs, and its cultures contained no haemolysins. On morphological grounds the organism should be classified in the same group with three known anaerobic species: N. reniformis, N. orbiculata, and N. discoides. Apart from other cultural and biological peculiarities, it differs from the above three species in its ability to digest milk and liquify gelatin. The new species was provisionally named Neisseria vulvo-vaginitis.

H. P. Fox

527. Iodine Treatment of Monilial Infection of the Vagina.

By C. WEEKES. Med J. Anst., 1, 636-638, May,

24, 1947.

The orthodox treatment of monilial vaginitis (with 2 per cent aqueous gentian violet, 4 per cent copper sulphate, or hexyl resorcinol) produces only temporary relief, with a high percentage of recurrences. Liquor iodi mitis (B.P.) was tried as an alternative. Before this treatment, cultures were taken from cervix and vagina, any cervical erosion was treated, and an iodine-sensitivity test was performed by painting a small area of vulval skin. The vagina was cleansed with sodium bicarbonate or hydrogen peroxide solution, the anus was protected with cotton-wool, and the vagina was then swabbed with the iodine. Painting was carried out twice weekly, three or four applications being usually necessary. The treatment was painful, but the patients' previous distress was such that they did not default.

Of 50 patents so treated, 38 were considered "cured", the criteria being freedom from pruritus and negative cultures for at least 1 month after the last application; most patients have been studied for longer than this (3 of the 38 subsequently relapsed, but responded for a longer period to further iodine treatment). Only 4 of the 12 failures had an uncomplicated monilial infection. The author gives detailed records of 6 cases which had resisted other methods of treatment over several months and ultimately responded to iodine.

Aileen M. Dickins

528. Treatment of Trichomonas vaginalis Vaginitis. By W. J. REICH, H. L. BUTTON, and M. J. NECHTOW. Surg. Gynec. Obstet., 84, 891-896,

May, 1947. 6 figs., 13 refs.

The authors examined 2,080 patients for evidence of Trichomonas vaginalis infection and found it in 541. They were able to study 205 of these, and 153 were under observation long enough to permit of a complete "follow-up" report. Common symptoms of infection were pruritus, and frequency and urgency of micturition. Less common were dyspareunia and vaginal spasm. Both Skene's tubules and Bartholin's glands were infected in 50 per cent of the heavily infected patients, and in 5 per cent of acute cases there was evidence of induration of the utero-sacral ligament. The diagnosis was confirmed by examination of hanging-drop preparations made from the vaginal secretion, frequently with the study of an additional wet smear and Gramstaining. In recurrent cases with bladder symptoms a hanging-drop preparation was made from a catheter specimen of residual urine.

Treatment consisted of electrofulguration of Skene's ducts, cauterization of erosions, and removal of polypi. The vagina was then dried and insufflated with 2 to 4 g. of a powder consisting of 20 per cent pulverized "argyrol", 40 per cent

kaolin, and 40 per cent  $\beta$ -lactose. The danger of air embolism is emphasized, and the use of a Graves type of speculum is advised to reduce this risk. Six capsules each containing 4 g. of the argyrol powder mixture were provided, with instructions to insert one each night after a douche of vinegar water (4 tablespoonfuls of white vinegar to 2 quarts (2.3 litres) of warm water). Precautions necessary after micturition and defaecation and during intercourse were explained. Treatment was not interrupted during a period, A week later the patient was re-examined, and in the absence of recurrence the above routine was continued for 3 to 4 weeks. If there was a recurrence of infection the treatment was continued for 5 to 7 weeks. No ill effects were observed from this treatment, and 98 per cent of the patients who were followed up were cured. These results were better than those obtained by the authors with any other form of treatment.

J. Stallworthy

529. Hyphomycetes and Saccharomycetes in the Vagina of the Newborn and of Females before the Age of Puberty. (Gli ifomiceti ed i saccaromiceti nella vagina della neonata e della donna impubere.)

By D. CAZZOLA and G. Mosconi. Arch. Ostet, Ginec., 42, 65-80, Mar.-Apr. 1947. 1 fig., 38 refs.

The authors review their previous work on the hyphomycetes and saccharomycetes found in the vagina at various periods during the child-bearing years in women, including the variations found in the puerperium and the different phases of the menstrual cycle. They conclude that the presence of these organisms in the vagina is not merely casual but that they play an important biophysical role.

The present work embodies studies on the appearance of these organisms in the vagina of the newborn female infant and their distribution during the years preceding puberty. From a review of the literature of the subject certain facts emerge. The stratified epithelium of the vagina appears at about the fourth month of intrauterine life. Desquamation occurs, so that a plug of cells rich in glycogen is formed within the vaginal lumen. The pioneer observations of Döderlein on the acid reaction in the vagina are quoted, together with observations by other authors showing that the reaction of the vagina is normally acid within 24 hours of birth but that later it becomes more nearly neutral.

The authors present original work on the flora of the vagina in newborn female infants, and the variations that take place in the first 24 months of life are graphically shown. It is found that saccharomycetes are present in the vagina in moderate amounts at birth. A slight fall in number occurs in the first 24 hours, followed by a sharp rise. A peak level is reached at the end of the first week, when there is a fall to a level which is constantly maintained. Hyphomycetes are present in very small numbers at birth, but the numbers rise to a peak at about the fourteenth day, and then undergo a slight fall to a constant level. The two levels are maintained until puberty, with slight individual variations. By the end of the second year of life the quantity of vaginal flora can be differentiated into high, mid-level, and low. It is believed that these organisms must be regarded as playing an essential part in the physiology of the normal vagina.

Iosephine Barnes

530. The Absorption of Penicillin by the Normal, Inflamed, and Gravid Uterus, and by Striped Muscle (Experimental Studies on the Guinea-pig). (Sul potere di assorbimento della penicillina da parte dell'utero in preda a processo flogistico, gravido ed in riposo e del tessuto muscolare striato. [Ricerche sperimentali sulle cavie.])

By F. Marchesi and U. Cavalcanti. Clin. ostet. ginec., 49, 145-152, Sept.-Oct., 1947.

17 refs.

531. Local Injection of Penicillin in the Treatment of Inflammation of the Adnexa. (Les injections locales de pénicilline dans le traitement des annexites.)

By M. Roux and P. Monod-Broca. Presse Méd., 55, 845-847, Dec. 20, 1947. 5 refs.

532. Abdominal Contusions and Rupture of a Pyosalpinx into the Peritoneal Cavity. (Contusione addominale e rottura di piosalpinge in peritoneo libero.)

By F. LOBELLO. Rif. med., 61, 526-529, Nov. 15, 1947. I3 reis.

533. Inflammation after Salpinography. (Onsteking na salpingographie.)

By B. S. TEN BERGE. Ned. Tijdschr. Geneesh., 91, 3594-3598, Dec. 13, 1947. 1 ref.

534. Pelvic Cellulitis with Perirectal and Pericolic Constriction due to Lymphogranuloma Venereum. (Celulitis pelviana con estrechez pericólica ý perirectal por enfermedad de Nicolas y Favre.)

By J. L. Boveri. Obstet. Ginec. lat-amer., 5. 407-420, Sept., 1947. 4 figs., 19 refs.

535. The Treatment of Tuberculous Salpingitis with Special Reference to X-ray Therapy.

By E. Philipp. Proc. R. Soc. Med., 40, 376-

378, May, 1947.
Thirteen cases of proven pelvic tuberculosis were treated by small repeated doses of X-rays. A total dosage of 600 r was given fractionally in a course of 12 to 18 treatments. In addition the author observed 5 patients treated by operation, I treated by streptomycin, and another who died before X-ray treatment could be started. In none of the series treated by X-rays up to date has relapse or death occurred. The underlying principle of the treatment is to set up a reaction to the X-ray trauma and thus help to clear up the tuberculous infection as well.

[For those who believe in conservative models of treatment in pelvic tuberculosis this paper is of interest.

Kenneth Bowes

536. Endometritis Tuberculosa. [In English.]

By B. Eriksen. Acta obstet. gynec. scand.,

27, 249-274, 1947. 3 figs., 60 refs.

A review is made of tuberculous endometritis with special reference to 38 patients treated for this condition, without involvement of the adnexa, in Danish hospitals between 1931 and 1940. Tuberculosis confined to the uterus represents, according to postmortem results, about 10 per cent of the total number of cases of genital tuberculosis. Except in rare cases of pyometra formation, uterine tuberculosis does not cause enlargement of the organ; indeed, in many cases the uterus is described as being small in size. The uterine secretion is generally not characteristic, only small quantities of tubercle bacilli being present in the secretion, and direct microscopical examination is therefore unimportant, unless the endometrium displays ulceration or has undergone caseous changes. Clinical diagnosis of the condition is very difficult. Cautious trial curettage, with examination of the curetted material, both histologically and by guinea-pig inoculation, is necessary when uterine tuberculosis is suspected. On account of the comparatively good prognosis of tuberculous endometritis, most authors regard large-scale surgical intervention as unnecessary in the milder cases. Hysterectomy may be required in the more diffuse forms of the condition. The value of radium treatment is discussed as well as that of X-ray treatment. In the 38 cases of isolated tuberculous endometritis the age incidence within the different groups was more uniform than is generally found with tuberculosis of the adnexa. Metrorrhagia was present in 44 per cent of the cases, vaginal discharge in 27 per cent, and sterility in 13.5 per cent. After hospital treatment 31.6 per cent of patients were left with, or developed, local symptoms. Tuberculous salpingitis occurred in 15.8 per cent, and a relapse of endometritis in 13.2 per cent of the cases. Two of the 38 patients have since given birth to children.

Falkland L. Cary

537. Diagnosis and Therapy of Female Genital Tuberculosis. (Zur Diagnostik und Therapie der weiblichen Genitaltuberkulose.)

By E. GLATTHAAR. Schwerz. med. Wschr., 77, 1219-1223, Nov. 22, 1947. 15 refs.

538. An Evaluation of the Criteria of Diagnosis and Cure of Gonorrhea in the Female.

By A. G. King. Amer. J. Obstet. Gynec., 53, 829-833, May, 1947. 5 refs.

In this paper the difficulties in diagnosing gonorrhoea and in ensuring that the patient is cured are discussed. It was found that with a single smear 59 per cent of the cases were missed, whereas with a single culture only 38 per cent were missed. With the combination of a single smear and culture 28 per cent were missed. With 2 smears at least 24 hours apart 24 per cent were missed, and with 2 cultures 10 per cent. With 2 smears and 2 cultures only 6 per cent were missed, while with 3 smears, 3 cultures, and the two combined the figures were 6, 3, and 0.2 per cent respectively. The author concludes that only with 3 smears and 3 cultures could the diagnosis of gonorrhoea be ruled out with any reasonable

The question of cure is even more difficult, for with 3 smears and 3 cultures in the 10 days after treatment 8 per cent of the failures were undetected. To determine a cure a succession of smears and cultures should be taken over a period of 2 months. Better results are obtained if the tests are made before, during, or after a menstrual period. The author considers that stricter and more uniform criteria for diagnosis and determination of cure should be established by professional agreement. The minimum examination proposed by him to rule out gonorrhoea consists of 3 smears and 3 cultures, and to determine a cure a succession of smears and cultures over a period of 2 months after treatment.

F. J. Browne

539. Migration of Oxyuris Vermicularis to Lymph 🔌 Node of Round Ligament.

By D. D. DEEDS. Amer. J. Obstet. Gynec., 54, 890-892, Nov., 1947. 2 figs., 3 refs.

540. A New Diagnostic Aid in Trichomoniasis Vaginalis. (Ein neuer Hinweis zur Diagnosestellung der Trichomonas vaginalis.)

By H. K. ZINSER. Zbl. Gynäk., 69, 148-151, 1947. 3 figs., 8 refs.

541. Vulvar Myiasis. (Miasis vulvar.)

By C. A. Brea and E. C. Canale. Rev. Asoc. méd. argent., 61, 734-735, Oct. 15-30, 1947. 3 figs., 17 refs.

New Growths of the Reproductive Organs

542. Radiotherapy for Gynecologic Cancer. By M. Garcia and J. V. Schlosser. New Orleans med. Surg. J., 100, 141-148, Oct., 1947. 22 refs.

543. Diagnostic Importance of the Cytological Features of the Vaginal Smear.

By A. P. PREOBRAZHENSKY, E. N. PETROVA, and M. D. Moiseenko. Akush. Ginek., No. 5, 22-28 1947. 4 figs.

544. The Vaginal Smear as an Aid in the Diagnosis and Treatment of Gynecological Conditions.

By G. T. NEWMAN. Med. Woman's J., 54, 20-26, Oct., 1947. 6 refs.

545. Melanoma of the Vulva with Report of Two

By K. M. WILSON. J. Mt Sinai Hosp., 14, 688-694, Sept.-Oct., 1947. 6 figs., 2 refs.

546. Melanosarcoma of the Vulva. (Melanosarkom der Vulva.)

By F. Teufelmayr. Zbl. Gynäk., 69, 354-360, 1947. 2 figs., 17 refs.

547. Two Cases of Vulvar Fibrolipoma. (Considerazioni su due fibrolipomi vulvari.)

By R. Arnone. Monit. Ostet-Ginec., 18, 5-18, Jan.-June, 1947. 4 figs. Bibliography.

548. Dosage Calculations for Various Plans of Intravaginal X-ray Therapy.

By J. F. Nolan and W. Stanbro. *Radiology*, 49, 462-475, Oct., 1947. 8 figs., 15 refs.

549. Fibroma of the Vagina. (Contribución al estudio del fibroma della vagina.)

By M. Breyter. Rev. Med. Cienc. af., 9, 476-479, Aug., 1947. 4 figs., 13 refs.

550. Fibromyomata of the Vagina.

By A. A. NIKOLSKAYA. Ahush. Ginek., No. 5, 56-57, 1947.

551. Early Diagnosis of Uterine Cancer by Vaginal Smear.

By M. FREMONT-SMITH. Surg. Clin. N. Amer., 27, 1215-1217, Oct., 1947. 5 refs.

552. Limitations of Histopathological Differential Diagnosis of Adenocarcinoma of the Cervix and Adenocarcinoma of the Body of the Uterus. (Limiti della diagnosi istopatologica differenziale fra adenocarcinoma della cervice e adenocarcinoma del corpo dell'utero.)

By E. LENZI. Riv. ital. Ginec., 29, 494-523, 1946. 8 figs., 12 refs.

553. Early Diagnosis of Carcinoma of the Uterus—the Physician's Responsibility.

By H. O. Jones. Texas St. J. Med., 43, 449-452, Nov., 1947. 6 refs.

55.4. Improvement of Results in the Treatment of Uterine Cancer.

By J. HEYMAN. J. Amer. med. Ass., 135, 412-416, Oct. 18, 1947. 8 figs., 6 refs.

555. Rectal Complications of Uterine Radium Therapy. (Les complications rectales de la Curiéthèrapie utérine; considérations cliniques et thérapeutiques.)

By M. A. Vachon and M. Dargent. Arch. Mal. Appar. dig., 36, 464-474, Sept.-Oct., 1947

556. Carcinoma of the Corpus Uteri.

By P. H. Oosterhagen. S. Afr. med. J., 21, 864-866, Nov. 22, 1947. 16 refs.

557. Carcinoma of Uterine Fundus. Treatment by Hysterectomy with Preoperative Radiation with Radium and Supervoltage Roentgen Therapy, and Postoperative Radiation with Supervoltage Roentgen Therapy.

By G. KAMPERMAN. J. Mt Sinai Hosp., 14, 401–417, Sept.-Oct., 1947. 6 figs., 7 refs.

558. Management of Large Uterine Myoma.

By W. D. Beacham and D. W. Beacham. Mississippi Doctor, 25, 197-202, Nov., 1947, 3 figs., 28 refs.

559. Cystic Degeneration of Uterine Fibromyomata. Report of a Case.

By H. K. TOPPOZADA. J. R. Egypt. med. Ass., 30, 476-486, Oct., 1947. 2 figs., 25 refs.

560. Three Cases of a Rare Uterine Malformation with Fibromyoma. (Su tre casi di rara malformazione uterina associata a fibromiosi.)

By M. Franceschim. Monit. Ostet.-Ginec., 18. 19-28, Jan.-June, 1947. 20 refs.

561. Leiomyofibroma of the Uterus and Endometrial Carcinoma.

By R. S. SIDDALL. Amer. J. Obstet. Gynec. 53,

846-850, May, 1947. 12 refs.

It is well known that uterine fibroids and endometrial carcinoma often coexist, and there has been considerable speculation as to whether there is some aetiological relation between them. Is it possible, for example, that since tumours in some respects resembling fibromyomata have been produced by injecting oestrogens, the latter also play a part in the actiology of cancer of the endometrium in women? Before such a question can be usefully discussed it is necessary to prove that there is in fact an unusually high incidence of endometrial cancer in fibroid as compared with Siddall investigated 2,246 non-fibroid uteri. abdominal hysterectomies performed in the Harper Hospital, Detroit; 1,672 ûteri were myomatous. Among these the incidence of endometrial carcinoma was 0.99 per cent. There were 574 cases entirely free of fibroids, and among these the incidence of endometrial cancer was 5.1 per cent. Again, a group of 50 uteri from patients with endometrial carcinoma was contrasted as to the incidence of fibroids with another series of the same size, comparable as to age and other factors except that cancer was absent. In the former the incidence of fibroids was 36 per cent, in the latter 46 per cent. The author concludes that there is no evidence from his data that fibromyomata of the uterus and endometrial carcinoma have an affinity for each other, but rather the reverse.

F. J. Browne

562. The Expelled Uterine Fibroid. (Fibromyoma uteri i Fødsel (fibromyoma uteri in expulsione))

By E. T. Madsen. Nord. Med., 34, 1087-1092, May 9, 1947. 29 refs.

A report is made of 60 cases of expelled uterine fibroids, of which 44 were submucous and 16 intramural. The latter are almost invariably necrotic or gangrenous, whereas the former may display hyaline or amyloid change or fibrosis. Expelled fibroids may vary in size from a pigeon's egg to a foetal head. Their detachment from the uterine wall is the result of periodic contractions of the uterus, which are also finally responsible for their expulsion. Vaginal haemorrhage occurs in nearly all cases, either as menorrhagia or as metrorrhagia; there is usually a moderate yellow or white discharge; anaemia may be extreme; pain is present over the symphysis pubis and lumbar vertebrae and is accentuated during menstruation. In these respects the condition resembles that with other fibromyomata of the uterus; the differential diagnosis is based on the presence of blood in the vagina, the dilatation of the cervix, the presence of a tumour in or protruding from the cervix and attached—in the case of submucous tumours to a stalk. In the gangrenous variety there are fever, rigors, and a deterioration of the general condition. There may be hypogastric pain, dysuria, and possibly retention of urine. The abdomen is tender and distended with gas and a tumour may be palpable. The patient may be in a state of shock. The vagina contains blood and a foulsmelling discharge. The erythrocyte sedimentation rate is raised, the haemoglobin lowered, and there is a leucocytosis. The most serious complication is anaemia, but the condition may be followed by cystitis, pyelitis, or even inversion of the uterus. A gangrenous fibroid may give rise to peritonitis. Spontaneous recovery is possible but should not be awaited because of the risk of severe anaemia; in treatment various operative techniques are mentioned as well as X-ray therapy. Of 60 cases, only one was fatal.

B. Nordin

563. Genesis and Migration of Uterine Fibroids. (Sulla genesi e sulla migrazione dei fibromiomi dell'utero.)

By A. DE PALO. Riv. ital. Ginec., 30, 198-207, 1947. 36 refs.

564. Hemangioendothelioma of Uterus.

By W. V. Knoll. *Urol. cutan. Rev.*, 51, 28-33,

Jan., 1947. 5 figs., 42 refs.

The history of this subject is reviewed from the original description by Rokitansky in 1846, until 1930, when Horgan reported I case, collected 20 previously reported, and classified them. Only 4 cases could be classed as cavernous haemangiomata in the uterine wall (Group I). The author describes I case and reviews 10 cases reported since 1930 which fulfil the requirements of Horgan's Group I. The significance and evolution of the term "endothelioma" are discussed. Reference is made to a review by Stout (Ann. Surg., 1943, 118, 445) of 18 cases of "tumours of blood vessels featuring vascular endothelial cells". Two criteria for

diagnosis are: "(1) the formation of atypical endothelial cells in greater number than required to line vessels: (2) the formation of vascular tubes with a delicate framework of reticulin fibres and marked tendency for their lumens to anastomose." Stout is further quoted as saying that "this rare neoplasm is in most instances malignant, but benign examples are known". Most of these benign forms appear early in life or are congenital. A full clinical and pathological study of the author's case is given. The controversy in regard to metastasis in these tumours is-discussed, the case reported having multiple peritoneal metastases. The rarity of this lesion is shown by the fact that the total number in the literature, including this case report, is fifteen.

C. W. Kimbell

565. Unusually High Hormonal Values Found in a Chorionepithelioma Appearing after Confinement. (Neobvykle vysoké hormonální hodnoty u chorinepitheliomu vzniklého po porodu.)

By J. Birgus and W. Cerny. Ceshoslov. Gynaek., 12/26, 173-192, 1947. 2 figs., 39 refs.

A patient, aged 31, 2-para and 3-gravida, com- 🥆 plained of painless vaginal haemorrhage of three months' duration after delivery of a normal child. She also had dyspnoea and haemoptysis. The course of her last pregnancy was normal except for a threatened abortion at twelve weeks. The haemorrhage was stopped by implantation of a pellet of 100 mg. "proluton" (progesterone). On examination, the vaginal lumen was found to be occluded by a breaking-down mass; per rectum the nterus was felt to be soft and enlarged, with both ovaries cystic. Chest radiography revealed metastases in both lungs. Necropsy revealed chorionepithelioma of the uterus, lutein cysts in both ovaries, and metastases in both lungs and left kidney.

The diagnosis of chorionepithelioma was based on histological examination of a biopsy specimen and the quantitative Aschheim-Zoudek test. The urine, cerebrospinal fluid, colostrum, and contents of the lutein cysts were examined for gonadotrophic hormones. An injection of o.ooi ml. of urine into immature female rats produced oestrus; the vaginal smear showed marked keratinization of epithelium, the ovaries haemorrhagic follicles and corpora lutea. Even an injection of 0.0002 or 0.0001 ml. of urine gave a positive vaginal reaction, but the ovarian reaction was confined to enlargement of the follicles. The urine contained, therefore, at least 10 million rat units prolan A and 1 million prolan B per litre. The cerebrospinal fluid was tested in mice: the respective values were over I million mouse units prolan A and 100,000 units prolan B per litre. (According to Zondek one mouse unit of gonadotrophic hormone equals five rat units.) In the colostrum approximately I million mouse units prolan B per litre were found. The contents of the lutein cysts were injected into

immature female rabbits, 2 ml. of the fluid being given daily for four days. The endometrium was

found to be in the luteal phase.

These values of gonadotrophic hormones are unusually high: the highest ever reported are those from a case of hydatidiform mole, mainely 3.5 million units prolan A and 1.5 million units prolan B per litre.

L. Ganz

506. Uterus Didelphys with Endometrial Polyp in Left Uterus.

By M. E. MINTZ. *J. Mt Sinai Hosp.*, **14**, 807–808, Sept.-Oct., 1947. 2 figs.

567. Chorionepithelioma: Hormonal Studies and Pathological Findings.

By E. KLEMPNER. J. Mt Smai Hosp., 14, 793-797, Sept.-Oct., 1947. 3 figs., 7 refs.

568. Malignant Chorionepithelioma of the Uterus with Pulmonary Metastases after Delivery at Term with Negative Aschheim-Zondek Reaction. (Malignes Chorionepitheliom des Uterus mit Lungenmetastasen nach rechtzeitiger Geburt und negative Aschheim-Zondeksche Reaktion.)

By P. Schugt. Zbl. Gynäh., 69, 361-367, 1947.

25 refs.

569. Epithelioma of the Uterine Cervix.

By J. C. Masson and D. B. Judd. J. Mt Sinai Hosp., 14, 483-490, Sept.-Oct., 1947. 1 fig., 5 refs.

570. Cancer of the Cervix. Bellevue Hospital Method of Treatment over a Period of Twenty-one Years.

By I. J. KAPLAN and R. Rosh. Amer J. Roentgen., 57, 659-664, June, 1947. 9 refs. Intravaginal Radiation Therapy.

By J. S. Bouslog. Amer. J. Roentgen., 57, 665-

670, June, 1947. 10 figs., 13 refs.

The Use of Long Interstitial Radium Needles in the Treatment of Cancer of the Cervix.

By G. W. WATERMAN, R. DILEONE, and E. TRACY. Amer. J. Roentgen., 57, 671-678, June, 1947. 4 figs., 8 refs.

The Radical Operation for Cancer of the Cervix. By J. V. Meigs. Amer. J. Roentgen., 57, 679-684, June, 1947. 5 refs.

The Surgical Treatment of Cervical Cancer. Wertheim Operation; Pelvic Lymphadenectomy.

By D. G. Morton. Amer. J. Roentgen., 57, 685-

696, June, 1947 I fig.

In a paper presented at the 28th Annual Meeting of the American Radium Society in June, 1946, Kaplan and Rosh, of the Bellevue Hospital, New York, give a review of their results with radium and X-ray therapy over a period of 21 years. They consider that X-ray therapy should precede the local application of radium, "as it is extremely effective in controlling pelvic involvement, allevi-

ates infection, and often appreciably reduces the local lesion". The authors use 200 kV. X-rays through a 0.5 or 1 mm. copper or "thoraeus" filter. Usually irradiation is given to four pelvic fields—two anterior and two posterior. In marked pelvic involvement or obesity lateral and perineal fields are added, the dose being 1,800 to 2,000 r (measured in air) to each field. In advanced cases, and where residual malignancy is present after radium therapy, an additional course of X-ray therapy is given. The local radium therapy is given with a special rubber colpostat devised by Kaplan, and both uterine canal and cervix are treated in all cases except where previous hysterectomy has been performed. The usual dosage is 7,000 to 8,000 mg.-hours—4,500 mg.-hours to the cervix and the balance to the uterus.

Cancer of the cervix is not nearly so common in Jewish women as in Gentiles, while the incidence in negresses is also low. This latter finding may be due to the fact that pelvic infection is not infrequent among young negresses, and radit' hysterectomy is a not uncommon procedure in such cases. The authors conclude that, in their experience of over 21 years, irradiation is the be' method of treatment of cervical cancer. In any but Stage 1 cases it is the method of choice, and even in Stage 4 cases irradiation often controls the condition and prolongs life in comfort.

Meigs of Boston, Massachusetts, deals with the place held by the radical operation in the treatment of cancer of the cervix, and gives the following reasons for preferring the operation to irradiation: "(1) If the cervix has been removed there is no chance for a recurrence in it. (2) If the cervix has been removed no cervical cancer can regrow in it as a recurrence. (3) Certain cancers of the cervix are radiation resistant. (4) There will be less damage to the bowel if surgery is undertaken. (5) From the work of both Bonney and Taussig, it is obvious that patients with lymph node metastases can be cured by surgery in some instances, and I believe that it is not possible to cure, with irradiation, cancer in lymph nodes deep in the pelvis." A very radical operation is advised by Meigs, but his cases are carefully selected. In the gr cases with which the paper is concerned the operative mortality was nil. There were 8 cases of utero-vaginal fistula, but the last of these occurred over 2 years ago and the author believes he now has overcome the danger of damage to the ureter. Metastases in lymph nodes were found in 18 (19.7 per cent) of the cases, and from this it is deduced that, if it is agreed that irradiation will not cure caucer in lymph nodes, irradiation would start with a 19.7 per cent deficit in this group of patients. Also, since it is unlikely that irradiation would destroy the tumour in all the nodes, particularly in the obturator region, surgery is more likely to cure than irradiation. Pre-operative radium and X-ray therapy was used in some of the cases; most patients had up to one-half the usual dose.

Tables are given comparing the results of surgery alone and surgery preceded by irradiation. Meigs concludes that "surgery in properly selected patients should and will give at least equally good results as irradiation, and in addition the cervix, the source of the disease, has been removed."

Wertheim's operation and pelvic lymphadenectomy are discussed by Morton, of San Francisco. As regards the former, Morton prefers a much less radical operation than that advocated by Bonney, particularly in dealing with the vaginal cuff to be removed. The author is not convinced that removal by surgery of affected lymph nodes produces an improvement in results, but admits that his cases are as yet too few to permit of conclusions being drawn one way or the other. He believes, however, that something has been learned from the microscopical examination of nodes removed either in the Wertheim operation or in simple lymphadenectomy, particularly as regards the effect of irradiation on them. Of 86 cases in which nodes were removed and examined, 51 had had no pre-operative X-ray therapy. In these regional node metastases were found in 18 (35.5 per cent) In 35 cases in which full X-ray irradiation had been given pre-operatively, lymph-node involvement was found in only 4 (11.4 per cent). These figures are highly suggestive, and the author argues that, if the contention could be proved, pelvic lymphadenectomy would be unnecessary. [Compare the above with the figures given by Meigs. Of 58 cases with no pre-operative irradiation therapy, 9 (15.5 per cent) had metastases in lymph nodes; and of 33 cases with pre-operative irradiation, 9 (27-3 per cent) had metastases in lymph nodes. Morton believes that, while surgery has a place in the treatment of cervical cancer, irradiation is the treatment of choice in the majority of cases, and he is of the opinion that irradiation is capable of destroying, and often does destroy, cancer in lymph nodes.

Two of the remaining papers comprising the symposium are concerned with the local application of radium and X-rays respectively. A technique (employed for 20 years) with long interstitial radium needles is described. The authors do not lay down any set plan for the insertion of the needles but deal with each growth individually, the number and situation of the needles varying from case to case. Details of dosage are given (6,000 to 9,000 mg.-hours on an average) and figures are quoted for the periods 1926-40 and 1936-40 which show a distinct improvement in results during the latter period.

In the paper dealing with the intravaginal application of X-ray therapy the author states that external irradiation is first given in order to stabilize the cancer cells and prevent any lymphatic extension. Details of technique with diagrams are included.

E. L. Nicolson

571. The Causes of Death in Cancer of the Cervix Uteri.

By R. R. DEALVAREZ. Amer. J. Obstet. Gynec.,

**54**, 91–96, July, 1947.

The causes of death are recorded in 55 cases of carcinoma of the cervix at the University of Michigan Hospital during the last 10 years. In all cases a complete necropsy was performed. The primary cervical growth is rarely the cause of death. In only I case did haemorrhage determine the fatal issue. The commonest cause of death (40 per cent) was a secondary effect on the excretory system-either uraemia due to ureteric obstruction by local or regional spread of cancer, or pyelonephritis resulting from obstruction due to the same cause. Gastro-intestinal obstruction or perforation of the bowel by carcinoma caused death in 13 per cent of cases. In 31 per cent death was attributed to pulmonary causes, almost equally divided between pulmonary oedema and pneumonia asociated with pulmonary metastases. A table is given of the incidence of metastases. It is of interest that 10 out of the 55 cases showed no metastases whatever. In the remainder the three commonest sites were, in almost equal proportions (25, 24, 23), bladder, ureter, and retroperitoneal lymph nodes. Rectum, lungs, and pelvic peritoneum form another large group (16, 11, 10).

In the management of the advanced case the author advises consideration of nephrostomy for the patient threatened with uraemia, even in the apparently moribund, who can be restored to "normal activity in reasonably comfortable circumstances". Cutaneous ureterostomy is under trial. Colostomy or lateral anastomoses to relieve bowel obstruction may also be considered.

[The author does not record the total number of patients presenting themselves for treatment during the survey, and, except in certain individuals, provides no note on the type of treatment of the primary growth which was adopted.]

W. I. C. Morris

572. Preliminary Report on Transvaginal X-ray Treatment of Carcinoma of the Cervix.

By H. B. Elkins. J. Iowa St. med. Soc., 37, 196-198, May, 1947. 4 refs.

The author asserts that previous reports on transvaginal radiotherapy have seldom included comparisons with control groups. This preliminary report, covering the period 1939-43, analyses 92 cases of cervical carcinoma treated by transvaginal X-radiation (in combination with external irradiation) and compares this series with 230 control cases treated by other methods (some combination of radium and X-rays), the original intention had been to adopt the method of alternate controls, but there would also appear to have been some clinical selection, at least in the earlier stages of the investigation.

Elkins and 'his colleagues now use a 200-kV. plant, with 0.5 mm. copper filtration, H.V.L. of 0.9 mm. copper, at 26.5 or 27 cm. T.S.D., using

Ferguson specula of either 3 or 3.8 cm. internal diameter. [Doses are not stated.] The different types of head used are not described, but none so far employed is considered by the author to be satisfactory and further designs are being studied. An entirely satisfactory speculum has likewise not yet been devised, and difficulties arise when a narrow vagina entails the use of a smaller speculum and consequently a smaller intravaginal Another serious difficulty not yet overcome is that, with the applicator in position, direct vision is impossible; the patient's movement during treatment is cited as a possible cause of the complications which followed in the series reviewed. Cases were grouped clinically according and comparative Schmitz's classification, analysis is as follows:

	Т	Transvaginal			Other methods			
Group:		II	ΙΙΪ	IV	Ι.	II	III	ΙV
No. of cases	- 0	6	50	36	14	39	137	40
Three-year survival Percentage		3	18	7	13	23	60	3
survival		50	36	19.4	92.8	59	47.3	7.9

The only statistically comparable groups are III and IV, and transvaginal X-ray therapy appears to be better than other methods for Stage IV but not for Stage III. This is attributed to the more limited parametrial dosage obtained from radium. Complications in pelvic viscera and external genitals are admitted to be high but are of a minor nature, and their incidence has been reduced by improved technique.

E. C. Easson

573. Clinical Experience with the Intracavitary Tube in the Irradiation of Cervical Carcinoma. (Klinische Erfahrungen mit dem Körperhöhlenrohr bei der Bestrahlung des Kollumkarzinoms.)

By R. K. Kepp. Zbl. Gynäh., 69, 333-337, 1947. 4 figs., 5 refs.

574. Cancer of the Cervix. Observation on the Effect of X-ray Therapy on Regional Nodes.

By L. Parsons. Surg. Clin. N. Amer., 27, 1231–1239, Oct., 1947. 3 figs.

575. Radiation Therapy of Carcinoma Cervix Uteri. By P. RAMA RAU. *Indian J. Radiol.*, 1, 92-105, Aug., 1947. 6 figs.

576. Radiation Treatment of Cancer of the Cervix. By G. Turner. Tex. St. J. Med., 43, 452-457, Nov., 1947. 6 figs., 4 refs.

577. Radiation Therapy for Cancer of the Cervix with an Analysis of the Fundamental Dosimetry.

By W. HARRIS and S. M. SILVERSTONE. *J. Mt Sinai Hosp.*, 14, 369-382, Sept.-Oct., 1947. 3 figs., 41 refs.

578. Carcinoma of the Cervix: Morphology, Prognosis, and Treatment. (Die Morphologie des Kol-

lumkarzinoms und ihre Bedeutung für die Prognose und Therapie.)

By C. Lauterwein. Z. Geburtsh. Gynäk., 128,-17-106, Mar., 1947. 15 figs., Bibliography.

[This detailed account is too long for abstracting and the original article must be read. The author describes in full detail 1,071 cases of carcinoma of the cervix treated in Berlin from January, 1933, to 1937. The cases are examined for prognosis, having regard to age, parity, stage of carcinoma, treatment (radiotherapy, Wertheim operation, or vaginal hysterectomy), and histology. Comparison with other large series of cases is made and a full bibliography of the literature given.]

E. D. Y. Grasby

579. Pathologic Aspects of Carcinoma of the Cervix Uteri.

By W. J. SIEBERT. Radiology, 49, 403, Oct., 1947.

580. Early Carcinoma of the Cervix; Its Pathological and Clinical Aspects.

By M. A. Goldberger and N. Mintz. J. Mt Sinai Hosp., 14, 784-792, Sept.-Oct., 1947. 11 refs.

581. An Evaluation of Complications Encountered in Cervical Carcinoma.

By E. M. Baker. Sth. Med. Surg., 109, 365-370, Nov., 1947. 13 refs.

582. Clinical Diagnosis of Carcinoma of the Cervix. By A. N. ARNESON. *Radiology*., 49, 400-402, Oct., 1947.

583. Biopsy and Colposcopy in the Early Diagnosis of Carcinoma of the Portio Cervicis. (Probeexzision und Kolposkopie in der Frühdiagnose des Portiokarzinoms.)

By G. Mestwerdt. Zbl. Gynäk., 69, 326-332, 1947. 1 ref.

584. Myoma of the Cervix. (Mioma del cuello uterino.)

By J. F. Albertelli and N. O. di Fonzo. *Prensa* méd. argent., 34, 2249-2252, Nov. 21, 1947. 2 figs., 11 refs.

585. Surgery of Carcinoma of the Cervix. (La cirugia en el cancer del cuello uterino.)

By C. Zuckermann. Rev. méd. Hosp. gen., 9, 934-936, Sept., 1947. 20 refs.

586. Carcinoma of the Cervix: Surgical Aspects. By J. I. Brewer. Radiology, 49, 404-405, Oct., 1947.

587. X-ray Treatment of Endometriosis. (Roent-genoterapia de la endometrosis.)

By F. M. DIAZ, P. FRANQUET, and A. PIERNES. Rev. med.-quirúrg. Pat. fem., 14, 522-530, Dec., 1946. I fig., 14 refs.

After discussing the various theories of endometriosis, the authors suggest that heterotopic endometrial tissue may arise in different ways. They

refer to the possibility of diagnosing some cases of uterine endometriosis by means of hysterosalpingography, since a communication may be seen between the uterine cavity and the depths of the myometrium. The ideal treatment is by local excision of the tumour. In some cases, however, this is technically impossible, and in other cases after successful operation the condition recurs. In such cases they consider X-ray treatment is of value. Radiation acts directly on the tumour, which is radiosensitive, and also indirectly by interfering with the hormonal action of the ovary. In patients over 40 a menopause should be induced with X-rays. In younger patients with small recurrences a temporary castration to control the hormonal action of the ovary should be carried out. If, however, the tumour is large it should be destroyed by both the direct and the ovarian effect of radiation. These views are in accordance with those of others, and this method of treatment has been successful in all the authors' cases, some of which have been observed over several years. They do not believe in routine postoperative radiotherapy, as surgery frequently results in permanent cure. Details of 3 cases treated successfully are given. Bryan Williams

588. Dysgerminoma of the Ovary in a 7-year-old Child.

By C. B. MAREK and M. D. PHILLIPS. Amer. J. Obstet. Gynec., 54, 893-894, Nov., 1947.

589. Neoplasm of a Supernumerary Ovary. Report of Two Cases.

By B. R. Kriss. J. Mt Sinai Hosp., 14, 798-801, Sept.-Oct., 1947. 1 fig., 13 refs.

590. Primary Ovarian Malignancy.

By J. V. CAMPBELL and D. SINGMAN. West. J.

Surg., 55, 263-272, May, 1947. 2 figs.

This article gives the result of a study of 69 cases in the gynaecological cancer clinic of Highland Alameda County Hospital, California. The clinic was opened in 1930, and all cases of primary ovarian malignancy found up to 1942 are included -a period that allowed a follow-up of at least 5 years. The authors find that their results, in the main, substantiate those reported in the literature. They admit that there is controversy about what tumours should be considered malignant (the "functional" tumours, for example). The paper is written mainly from the clinical standpoint, dealing with history, early symptoms or their absence, duration of life after operation, the occurrence of metastases and ascites, and the effects of X-ray treatment. The main classification is into cystic, solid, and functional tumours. There was a marked preponderence of cystic tumours, of which by far the greatest number were papillary serous cystadenocarcinomata. The authors end by posing the question: "Should all menopausal or post-menopausal enlargements or tumours of the ovary be removed irrespective of size or symptoms? " Eardley Holland

591. The Question of Theca-cell Tumours of the Ovary and their Hormonal Function. (Zur Frage der Thekazelltumoren des Ovariums und ihrer hormonalen Funktion.)

By H. Limburg. Z. Geburtsh. Gynak., 128,

186-206, June, 1947. 14 figs., 34 refs.

This paper contains good descriptions of 5 cases of theca-cell tumours accompanied by postmenopausal hyperplasia of the endometrium. In 1 of the cases, 3 years after partial removal of a theca-cell tumour, the residue had developed into a simple fibroma. It is probable that all fibromata of the ovary are end-products of theca-cell tumours, analogous to the corpus fibrosum. Oestrogenic ovarian tumours fall into three related groups: (1) pure granulosa-cell tumours, (2) theca-cell tumours, and (3) mixed granulosa-cell and theca-cell tumours. Luteinization may take place in any of these. The paper includes an account of a mixed granulosa-cell and theca-cell tumour in a child of 2 years with precocious puberty.

R. Willis

592. Ovarian Adenoacanthoma Associated with Endometriosis of the Ovary.

By J. F. Kuzma. Amer J. Obstet. Gynec., 53,

245-251, Feb., 1947. 4 figs., 5 refs.

The adenoacanthoma is a rare tumour, first described in 1907. Its histology shows a mixture of glandular elements and squamous epithelium. It is most often found in the uterus and, next, in the intestinal tract. Only 6 cases of adenoacanthoma in the ovary seem to have been reported, but the author here reports and fully describes 2 new cases. Both of them were shown to have been associated with ovarian endometriosis, and the development of squamous cells seems to have been by metaplasia. It is suggested that the ovarian endometriosis may become a malignant neoplasm.

Eardley Holland

593. Adenoacanthoma of Ovary Arising from Endometrial Cyst, With Report of a Case.

By E. Novak. J. Mt Sinai Hosp., 14, 529-533, Sept.-Oct., 1947. 4 figs., 6 refs.

594. Arrhenoblastoma.

By C. J. ROPER. J. med. Ass. Georgia, 36, 393-396, Oct., 1947. 5 refs.

595. Meig's Syndrome. (Sindrome de Meig)
By J. Orgaz. *Rev. méd. Cordoba*, 35, 501–505,
Sept., 1947. 2 refs.

596. Differential Diagnosis of Renal Cysts Simulating Ovarian Tumours. (A proposito di diagnosi differenziale dell cisti renali simulanti tumori ovarici.)

By A. RIZZUTI. Ginecologia, Torino, 13, 443-449, Sept., 1947. 1 fig.

597. Psammocarcinoma of the Ovary. (Sul carcinoma psammoso dell'ovaio.)

By E. Debiasi. *Riv. ital. Ginec.*, 29, 524-543, 1946. 12 figs., Bibliography.

598. Auto-intoxication and Coma Induced by Torsion of the Pedicle of an Ovarian Cyst. (Autointoxicação e coma em quisto de ovário com pedículo torcido.)

By G. Maurity Santos and F. A. Braga Lopes. An. brasil. Ginec., 23, 119-124, Feb., 1947. 1 fig.,

A woman, aged 52, with a previous history of pain in the right iliac fossa, fever, headache, vomiting, and constipation, was admitted to hospital in a state of coma vigil. Gynaecological examination revealed the existence of a torsion of the pedicle of an ovarian cyst. In addition to abdominal symptoms she presented signs of general intoxication, such as fever (37.5°C.), coated tongue, diarrhoea, hypertension (220/120 mm. diminished tendon reflexes, and azotaemia. operation, which was followed by an uneventful recovery, an ovarian dermoid cyst with partial necrobiosis and torsion of the pedicle was found. Since a general and complete examination did not elicit any other cause which could account for the signs of intoxication, the latter is attributed to the cyst. A similar case—in which the patient did not recover from the coma-was seen in the same hospital 2 years previously. No mention of similar symptomatology was found by the authors in modern literature. A. Lilker

599. Radiological Signs of Ovarian Dermoid Cysts. (Zur Röntgen Symptomatologie von Dermoidzysten des Ovariums.)

By O. Wichtl. Klin. Med., Wien, 2, 932-934, Oct. I, 1947. I fig., 8 refs.

600. Cystic Teratoma (Dermoid Cyst) of the Ovary. A Study of Fifty-two Cases.

By W. S. Quinland and I. R. St. Hill. Sth. med. J., 40, 908-914, Nov., 1947. 7 figs., 16 refs.

601. Granulosa-cell Tumour of Ovary as Acute Abdominal Emergency.

By A. C. Brewer. Brit. med. J., 1, 49, Jan. 10, 1948. I ref.

602. A Case of Primary Carcinoma of the Fallopian Tube. (Ein Fall von primarem Tubenkarzinom.)

By G. Luckhaus. Zbl. Gynäk., 69, 367-370, 1947. 3 figs., 4 refs.

603. Cavernous Hemangioma of the Fallopian Tube.

By A. B. Ragins and R. D. Crane. Amer. J. Obstet. Gynec., 54, 883-886, Nov., 1947. 3 figs.,

604. Diagnosis and Management of Pelvic Endometriosis.

By F. L. PAYNE. J. med. Soc. New Jersey, 44, 496-500, Dec., 1947.

605. Endometriosis of the Intestinal Tract. By M. R. Sutler. Surgery. 22, 801-805, Nov., 1947. 2 figs., 23 refs.

Operations 5

606. Early Ambulatory Treatment in Gynecologic Surgery.

By F. D. TAYLOR. Texas St. J. Med., 43, 382-384, Oct., 1947.

607. The Abuse of Pelvic Surgery in the Female. By N. F. MILLER. Sth. Surg., 13, 821-830, Nov., 1947. 7 refs.

608. On Conservation of Function in Gynecology. By V. Bonney. J. Mt Sinai Hosp., 14, 152-158, Sept.-Oct., 1947. 2 figs.

609. Preliminary Hemostasis as an Adjuvant in the Conservative Surgery of the Uterus.

By P. E. Borras. J. Mt Sinai Hosp., 14, 159-166, Sept.-Oct., 1947. 9 figs.

610. Blood Pressure and Gynaecological Operations. (Blutdruck und gynäkologische Operationen.)

By G. Schafer. Zbl. Gynäk., 69, 381-396, 1947 9 figs., 16 refs.

611. Peritoneoscopy in Gynaecology.

By E. Y. DERTABUNA. Akush. Ginek., No. 5, 46-48, 1947.

612. Surgical Treatment of Acute Utero-pelvic Thrombophlebitis. (El tratamiento quirúrgico de la trombossebitis úteropelviana aguda.)

By A. JAKOB and C. C. SONTAG GANDARA. Obstet. Ginec. lat.-amer., 5, 346-349, Aug., 1947.

613. Sympathectomy and Intraspinal Alcohol Injections for Relief of Pelvic Pain.

By J. P. GREENHILL. Brit. med. J., 2, 859-862, Nov. 29, 1947. 12 refs.

614. Sympathectomy for the Relief of Pelvic Pain 'in Women.

By J. P. GREENHILL. J. Mt Sinai Hosp., 14, 363-368, Sept.-Oct., 1947. 8 refs.

615. Application of Auto-hemotherapy in Gynecological Cases.

By R. WALLIS. J. Mt Sinai Hosp., 14, 671-673, Sept.-Oct., 1947.

616. Utero-tubal Insufflation in Uterine Malformations.

By O. Jurgens. J. Mt Sinai Hosp., 14, 199-203, Sept.-Oct., 1947. 3 figs.

617. Results with Endometrium Implantation in the Vagina. (Nuestros resultados en la implântación del endometrio en vagina.)

Toko-ginec. práct., 6, By J. Poblacion.

147-152, May, 1947. 2 figs., 12 refs.

The author believes that the endometrium has a stimulating action on the ovary, and therefore carries out an implantation of endometrium into the vagina in order to avoid ovarian deficiency after hysterectomy. The whole uterus is removed and opened in the midline with a fine scalpel, and a fragment of endometrium about 1 cm. long is excised and placed in saline till the first part of the operation is completed. A site on the posterior vaginal wall about 4 or 5 cm. from the introitus is then selected, a longitudinal incision made and the mucous membrane dissected up on each side. The endometrium is then sutured in place with catgut and the wound left open. Care is taken to exclude any pathological condition by a careful investigation and examination of the uterus, and to avoid trauma to the endometrium by antiseptics, cauterization, or previous curettage. The implantation is best carried out in the first half of the menstrual cycle.

Twenty-one cases are reported, of which 18 were followed up. In 13 of these no abnormality was present, and all had a slight loss which occurred at monthly intervals, except in 1 case in which the interval was 5 months. In 4 cases there was no loss, but signs of ovarian insufficiency were also absent. In the remaining case the implant was removed 2 months after operation, as it was suspected that an endometrioma was forming, but this was not supported by histological examination.

The author considers this procedure a useful one both on account of the good psychological effect of the bleeding, even when slight, and of the stimulating action which the endometrium has on the ovary. It is free from risk if care is taken to exclude pathological changes in the endometrium.

Bryan Williams

618. Improvement in Abdominal Hysterectomy Mortality.

By R. S. SIDDALL and H. C. Mack. Surg. Gynec. Obstet., 85, 176-184, Aug., 1947. 2 figs., 1 ref.

Figures from the Harper Hospital, Detroit, showing the mortality from operations hysterectomy in three 5-year periods—1928-32, 1933-40, and 1941-45-are analyzed. In all, approximately 7,000 hysterectomies were performed, of which 30 per cent were total. There were 110 deaths. All cases are included in the report—that is, those performed for pelvic malignancy and obstetrical complications as well as for benign conditions. Radical hysterectomy for carcinoma of the cervix was not performed, or very rarely, in the period under review. A progressive decline in mortality was noted from 3.7 per cent in the first period to 1.65 per cent in the second and 0.78 in the third. A striking improvement was observed in the mortality following total hysterectomy as compared with that after the subtotal operation. In the first period total hysterectomy was twice as dangerous as the subtotal; in the last period the mortality from the two operations was about equal. Peritonitis, haemorrhage (including shock and cardiac failure), and embolism were the most frequent causes of death. The percentage figures for the three periods were: peritonitis, 64, 50, and 31; haemorrhage, 15, 30, and 26; embolus, 17, 2, and 21.

The progressive improvement is considered to be due to the more frequent use of blood transfusion, both before and after operation. In the earlier years the more difficult method of direct transfusion was used; since 1935 only the "vacoliter" method has been employed. A blood bank was established in 1938. Chemotherapy is regarded as a potent factor, but its exact value was difficult to estimate from the notes available.

T. C. Clare

619. Abdominal Hysterectomies Performed at Rhode Island Hospital, 1941 through 1945.

By R. E. Martin. Rhode Island med. J., 30, 723-726 and 728, Oct., 1947. 2 figs., 1 ref.

620. Vaginal Hysterectomy Subsequent to Extraperitoneal Cesarean Sections.

By E. G. WATERS. Amer. J. Obstet. Gynec., 54, 687-688, Oct., 1947.

621. Rapid Technique of Subtotal Hysterectomy after Caesarean Section. (Technique rapide d'hystérectomie subtotale après césarienne.)

By J. Gaillard. Rev. franc. Gynéc., 42, 270-271, Oct., 1947. 4 figs.

622. Excision of the Cul-de-sac of Douglas for the Surgical Cure of Hernias through the Female Caudal Wall, Including Prolapse of the Uterus.

By R. Torpin. J. med. Ass. Georgia, 36, 396-406, Oct., 1947. 7 figs., 29 refs.

623. Gilliam Suspension: Observations on Technique.

By J. K. FEENEY. J. med. Ass. Eire, 22, 11-14, Jan., 1948. 2 refs.

624. Results of Hysteropexy by the Technique of Kocher and Müller in 100 Cases. (Erfaringer med exohysteropexi a.m. Kocher and Sv. Muller paa grunlag af 100 tilfælde.)

By K. BIERRING and K. B. RASMUSSEN. Nord. Med., 36, 2475–2477, Dec. 12, 1947. 6, figs.

625. Indications for Surgery of the Ovary.

By L. A. EMGE. California Med., 67, 211-216, Oct., 1947. 25 refs.

626. Bilateral Oophorectomy in Early Pregnancy. Cesarean Section at Term.

By H. K. Bonn. Arch. Surg., Chicago, 55, 288-291, Sept., 1947. 3 refs.

627. History and Technique of Plastic Operations on the Vagina. (Historia y técnica de las operaciones vaginoplásticas.)

By E. Weber. Toko-ginec. práct., 6, 251-285, Oct., 1947. 5 figs., 52 refs.

628. Plastic Operations for Sexual Ambiguity (Gynandrynes and Androgynes).

By G. COTTE. J. Mt Sinai Hosp., 14, 170-174, Sept.-Oct., 1947. 3 figs.

629. The Use of Split-thickness Skin Grafts in the Construction of an Artificial Vagina.

By M. A. GOLDBERGER and J. A. GAINES. *J. Mt Sinai Hosp.*, 14, 347-351, Sept.-Oct., 1947. 1 fig., 16 refs.

630. Congenital Absence of Vagina. Treatment and Aftercare. Report of a Case.

By R. J. Crossen. J. Missouri med. Ass., 44, 903-906, Dec., 1947. 4 figs., 12 refs.

631. An Extravaginal Technique in the Operation for Urethro-vaginal and Vesico-vaginal Fistulas. [In English.]

By A. Ingelman-Sundberg. Gynaecologia, Basel, 123, 380-385, June, 1947. 6 figs.

The author recommends that the operative repair of urethro-vaginal and vesico-vaginal fistulae should be done under local analgesia with the addition, if necessary, of intravenous anaesthesia.

A triangular flap of mucous membrane is dissected free from the anterior vaginal wall, with the apex near the clitoris and the base just above the introitus vaginae. A sleeve of mucous inembrane about 3 to 4 mm. wide is left around the urethral orifice. [In the abstracter's opinion this incision comes too far forward, and access is not improved by removing mucous membrane between the clitoris and the urethra.] The incision is extended laterally and upwards so that the whole anterior vaginal wall is separated and urethra and bladder are exposed. Mucous membrane alone is dissected off and fascia and muscles are left intact.

When the fistula is reached it is isolated as well as possible and divided close to the vaginal mucosa. The fistula is invaginated and a row of sutures placed outside it. [The suture material used is not indicated. The author states that a thorough invagination is possible because the bladder is exposed; but in repair of a vesico-vaginal fistula the bladder is always exposed, and success depends on accurate closure of the hole in the bladder, freedom from tension, and use of a satisfactory suture material.]

The further steps of the operation recommended are separation of the pubo-cervical ligaments, suturing them together under the floor of the bladder, and fixation on to the anterior surface of the cervix. Occasionally the anterior portions of the levator ani muscles and, in cases where the fistula involves the urethra or bladder neck, the bulbocavernosus muscles are defined and sutured together. [The diagrams of suturing of these ligaments and muscles are difficult to understand, as the proportionate sizes and relative depths of the structures are unusual. The bulbocavernosus muscle is almost as large as the anterior portion of the levator ani. The author claims that the advantages of his technique are: (1) a better view

of the anatomy; (2) a thorough invagination of the fistula, possible because the bladder is exposed; (3) a strong interposition of the soft parts between the vagina and the bladder; (4) the fact that the incision in the bladder wall is not located in the same place as the defects in the vaginal wall; (5) through the plastic repair of the floor of the bladder and the elevation of the bladder neck, a minimal risk of secondary incontinence.

Gladys Dodds

632. The Repair of Intractable Rectovaginal Fistula: A New Procedure.

By J. H. GARLOCK. J. Mt Sinai Hosp., 14, 302-307, Sept.-Oct., 1947. 3 figs., 1 ref.

633. Stress Incontinence in the Female.

By R. A. Reis and E. J. De Costa. Amer. J. Obstet. Gynec., 53, 776-786, May, 1947. 7 figs., 31 refs.

The degree of uterine prolapse is no measure of the presence or absence of stress incontinence. Although methods of treatment of stress incontinence vary widely in anatomical and physiological approach they all achieve approximately 80

per cent of successful cures.

The anatomy of the female urethra is described, particular attention being paid to the distribution of the musculo-fascial layers surrounding the urethra. The physiology of micturition is then reviewed, the involuntary function of the internal sphincter and the voluntary function of the external sphincter being emphasized. Angulation of the urethra at the vesical neck is mentioned as a possible but unproved factor in the maintenance of continence. The authors believe the cause of stress incontinence to be damage to the whole mechanism of micturition rather than to one particular part of it alone, and mention the possibility of inherent weakness in the constitution of the tissues involved.

Most of the generic types of operation for the relief of this condition are quoted, and it is observed that they are all based on tightening of the supporting structures of the urethra. The technique described is a modification of Berkow's operation of para-urethral fixation; a diamondshaped incision including the urethral orifice is made, and a second circular incision around the orifice; the mucosa between the two incisions is removed; the urethra is freed by dissection and carried upwards and forwards, both to angulate and to elongate it. The pubococcygeus muscles are now united over the urethra to form the first line of support, and the urethral orifice is anchored close up to the clitoris, in its advanced position. The second and third lines of support are the bulbocavernosus muscles and the vaginal mucosa, each sutured with interrupted mattress stitches. Chromic catgut No. oo is used throughout. A selfretaining catheter is left in situ for 5 to 7 days. The operation may be combined with any other vaginal repair necessary. Patients were allowed up

in 48 hours, and could be ambulant even with the

indwelling catheter in place.

The series recorded is of 33 patients aged from 28 to 82; 29 were parous. A urethrocele was demonstrable in 50 per cent of the patients; the majority (18) had some other form of uterine or vaginal prolapse. Complications occurred in 22 per cent. After 4 months, 31 out of 33 showed and urinary control. continence Urethral massage over a Walther urethral dilator twice weekly is recommended in the late convalescent period (6 to 12 weeks) as a means of retaining normal tissue tone. Of the two failures, one occurred in a patient who had had a colpocleisis performed with antero-posterior suturing which created permanent tension on the neck of the bladder; the other patient had had temporary relief from very varied procedures but continued to relapse, and her symptoms were considered to have a primarily psychosomatic basis.

Hugh R. Arthur

634. Discussion on Stress Incontinence in Micturition.

By E. WILLIAMS, T. MILLIN, J. C. MOIR, and D. M. STERN. Proc. R. Soc. Med., 40, 361-370,

May, 1947. 4 figs., 6 refs.

The operative treatment of stress incontinence in women continues to be a topical subject of discussion. At a recent meeting of the Royal Society of Medicine the speakers described the measures favoured by themselves. There was general agreement that a varying percentage of these cases were cured by routine vaginal operations, which should be tried first in lesions caused by childbirth, and that the aim of operation was to elevate the region of the bladder neck. In cases where vaginal plastic operation had failed to cure and in cases of congenital origin other operative measures should be considered. Williams exposes the region of the bladder neck by suprapubic approach, and then pulls it up by suturing the immediately adjacent bladder wall on either side to the periosteum of the posterior surface of the os pubis by four or more non-chromic catgut sutures. Good results were quoted.

Millin described in detail his technique, the operation having the advantages of being carried out in one stage and being based on a sling principle. By transverse lower abdominal approach the bladder neck is reached and two fascial slings are raised, one on each side. The upper urethra is identified by a catheter in the bladder, and by blunt dissection a passage is made round it posteriorly. A special curved forceps devised by the author is used to make this passage, through which the slings are now drawn and tightened. This operation has given excellent results in 67 cases. Operative difficulties may arise owing to bleeding from the clitoral veins, and from freeing the urethra.

Chassar Moir has mainly studied the Aldridge and Studdiford techniques and has been gratified by the results, particularly in cases of vesicovaginal fistula with incontinence remaining after cure of the fistula.

Stern demanded a more careful analysis of each case of stress incontinence and a selection of the appropriate method of treatment. He has had only 2 failures after vaginal operation in 77 cases.

Kenneth Bowes

635. Results of Stoeckel's Direct Muscle Repair in Insufficiency of the Vesical Sphincter in the Female. (Erfolge mit der Stoeckelschen direkten Muskelplastik bei der weiblichen Blasensphinkterinsuffizienz.)

By F. Palik. Zbl. Gynäk. 69, 422-427, 1947.

Urology

636 Spontaneous Vesico-vaginal Fistula in a Tuberculous Bladder. Report of a Case.

By L. EDELMAN. J. Mt Sinai Hospital, 14, 276-279, Sept.-Oct., 1947. 7 refs.

637. Podophyllin Treatment of Soft Papillomas of the Female Urethra.

By W. J. Reich, M. J. Nechtow, and M. W. Rubenstein. Amer. J. Obstet. Gynec., 53,

658-662, Apr. 1947. 3 figs., 8 refs.

The dramatic results obtained with podophyllin in the treatment of condylomata acuminata suggested its use in the treatment of soft papillomata of the urethra, the pathological picture being much the same. Podophyllin, the active principle of the herb mandrake or May apple, is a resin with marked delayed, irritant, local action. It has been used in a strength of 20 to 25 per cent in an oil or a "lanolin" base for the treatment of condylomata acuminata.

The authors applied podophyllin ointment (25) per cent) in a hydrosorb base with an orange stick to the surface, sides, cracks, and crevices of the lesion. The adjacent normal skin was protected by Lassar's paste, collodion, or a mild anaesthetic ointment. Often the podophyllin was smeared and spread when the patient walked. To ensure proper contact she should remain in the lithotomy position for 20 to 30 minutes after its application. An immediate reaction is not evident although some pain may result within 6 to 8 hours. She should wash the ointment off in 3 to 6 hours with bland soap and water. If this step is omitted the local reaction may be very painful. A mild anaesthetic ointment is then applied over the lesions. Marked local inflammatory and oedematous reaction follows in the next 12 hours, and in 2 to 5 days the lesions shrivel and drop off. Pain and discomfort are not always experienced. The drug is considered to act by local irritation, causing vascular spasm resulting in ischaemia, necrosis, and sloughing. Eight cases have been treated. One treatment sufficed in 6 cases, but 2 patients needed weekly treatment for three weeks.

Anthony W. Purdie

638. Irradiation Reactions in the Bladder: Their Occurrence and Clinical Course Following the Use of X-ray and Radium in the Treatment of Female Pelvic Disease.

By E. M. Walson, C. C. Herger, and H. R. Sauer. *J. Urol.*, 57, 1038-1053, June, 1947. 4 figs., 13 refs.

Irradiation reactions in the bladder after the use of X-rays and radium in the treatment of pelvic disease in women were studied.

Of 5,990 patients treated from 1933 to 1944, 164 (2.74 per cent) were known to have developed changes in the bladder. In 4 they were acute effects, and in 160 late effects.

Time Interval Between Radium Treatment and Onset of Bladder Lesion Correlated to Dosage of Irradiation Delivered\*

5) 177 data 11.00 2000 00					
Time between Radium Application and Onset of Lesion		Patients Receiving More than 6,000 MgHours	Total		
Under I years 1 to 2 years 2 to 3 ,, 3 to 4 ,, 4 to 5 ,, 5 to 6 ,, 6 to 7 ,, 7 to 8 ,, 10 to 11 ,, 12 to 13 ,,	13	4 3 2 1	17 49 31 31 13 76.2% 4 1 2 3 1 1		

<sup>\*</sup> In 122 cases receiving only one course of treatment.

Correlation of Amount of Radium Radiation
Delivered and Severity of Late Radium
Reaction in the Bladder

Radium Radiation (mghrs.)	Grade I	Grade II	Grade III	Total
1,500 to 4,000	31	21	31	83
4,000 to 6,000	16	19	13	48
6,000 to 10,000 Over 10,000	٥	) O	0	24 5
3 7 01 10,000	55	49	56	160

Three grades are described, depending on the severity of the lesion. It does not appear that the amount of irradiation greatly influenced the incidence of bladder reactions.

It is suggested that there are four factors responsible for these late reactions: (1) individual tolerance to irradiation; (2) anatomical variations; (3) faulty technique; (4) excessive dosage. The prognosis is favourable except where irreparable damage has been done; 78.8 per cent of the lesions healed, 42 without treatment. Healing may take up to 18 months, the average healing time being 11.4 months.

The method of treatment depends on the severity of the reaction. Where this has been mild no treatment is required, except when there is excessive or persistent haemorrhage. Coagulation of the bleeding vessels almost invariably stops the bleeding. This must be employed cautiously so that the bladder wall is not further destroyed. In the more severe types instillation of weak silver nitrate solutions was found useful. In the very severe types, where there is much sloughing, favourable results have been obtained by irrigation with solution G through a three-way Foley-Alcock catheter. Where there are fistulae successful results by surgical repair are few; in these cases the urinary stream should be diverted. A. W. Badenoch

#### Miscellaneous

639. Gynecography.

By I. F. Stein. J. Mt Sinai Hosp., 14, 634-645, Sept.-Oct., 1947. 9 figs., 18 refs.

640. A Second Case of Irreducible Prolapse of the Uterus.

By R. T. Frank. J. Mt Smai Hosp., 14, 299-301, Sept.-Oct., 1947. 1 fig., 2 refs.

641. Enterocele or Posterior Vaginal Hernia. By J. V. Meigs. Surg. Clin. N. Amer., 27, 1226-1230, Oct., 1947. 2 refs.

642. Haematoma of Vagina and Vulva. (Haematoma vulvae et vaginae.)

By G. J. Lubbers. Ned. Tijdschr. Genecsk., 91, 3603-3607, Dec. 13, 1947.

643. Volvulus of the Adnexa. (Volvulo 1- los anexos uterinos.)

By H. A. Mendiondo. Prensa méd. argent., 34, 2155-2158, Nov. 7, 1947. 4 figs.

### THE

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# THE USE OF THE "PHASE-CONTRAST" MICROSCOPE IN CLINICAL GYNAECOLOGY

## A Preliminary Report

BY

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ANI

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The phase-contrast microscope, a recent innovation in microscopy, promises to be of great value in cytological investigations. This instrument has particular significance for the gynaecologist since it may be used without any additional laboratory adjuncts for the study of fresh cells obtained from regions of the genital tract not ordinarily visible and in which non-symptomatic malignant changes may be occurring. These cells can be recognized without special techniques and studied during the course of a clinical examination of the patient.

It is the purpose of this preliminary report to draw attention to this microscope, whereby cells obtained by smear, pipette or scraping techniques may be studied immediately in the fresh state without stains and to show the ease and clarity with which the cytoplasmic structure and nuclear characteristics of such cells may be observed.

Provided reliable criteria are established, the recognition of normal or malignant cell types with the phase-contrast microscope requires no greater experience than that for the diagnosis of stained paraffin sections and the necessity for a full acquaintance with the diverse cell types usually found in the vagina does not arise. With such criteria this technique will be easily applied to the rapid diagnosis of malignant and nonmalignant conditions in which cell cytology is recognizably altered. When this improved microscope becomes generally available at moderate cost the study of cells from the gynaecological tract will be

possible in the out-patient clinic or consulting rooms, with as little difficulty as is currently experienced in the study and diagnosis of *Trichomonas* or *Bacterium coli*.

#### MATERIALS AND METHODS.

The material used in this study was obtained from patients in private practice and from the clinics and wards under the jurisdiction of the Department of Gynaecology, University of the Witwatersrand. tissue was removed by pipette, blunt spoon-shaped small curette, or by scraping the vagina or cervix with the gloved finger. Thereafter, a suspension of the tissue was made in Ringer's solution. This solution was found to be a satisfactory medium for the tissue cells, particularly if rapidly cooled pending examination. In such circumstances, no gross change in cell structure occurs even after 24 hours. However, in the presence of malignancies, particularly, the rich bacterial flora usually precluded storage at low temperature since the cells undergo rapid lysis in their pres-In such cases it is desirable to examine the tissue as soon as possible, preferably within a matter of hours.

The examination of this tissue is best carried out within an hour of its removal. A single small drop of the agitated fluid is removed on to a clean slide and is covered with a glass cover-slip. The edges of the cover-slip are sealed with vaseline to minimize fluid currents and desiccation. The tissue is then ready for examination. In an effort to duplicate as closely as possible the circumstances in which detached malignant cells would normally be found in the vagina or cervical canal, only those malignant cells from carcinomas of cervix or endometrium which were cast adrift, as it were, in the Ringer's solution were taken for study. So far as normal cervical tissue and endometria from benign uteri are concerned "teased" preparations were made in order to obtain standard cell types.

Because detached cells are not always easily identified out of context with epithelial layers it was decided that only those tissues whose identity was to be established by ordinary histological methods should be utilized. As our experience of these cells increased the need for a cross-reference with paraffin sections diminished, and it became possible to assess much of this material with the aid of the phase-contrast microscope alone.

In this investigation a monocular phasecontrast microscope was available. The physical principles of the microscope have been described elsewhere (Richards, 1944). The light source was a General Electric 150-watt Spotlight filtered through a 4-inch layer of water at a distance of approximately 4 feet. A heavy green filter prevented eye strain when making direct observations, but for photography a light green filter ×40 was satisfactory. Kodak contrast process ortho film 9 × 12 cm. was held in an ordinary bellows camera without lenses, at a distance of 40 cm. from the objective. A 10 × eyepiece was used with a 45 × objective lens for reproducing vaginal smears, but for all other tissue a 95'× oil immersion objective was preferable. Time exposure for high-power studies was 4-7 seconds and for oil immersion 5-9 seconds.

While photographic reproduction is entirely unnecessary for observation and diagnosis of any tissue it has been used extensively in our studies for purposes of record, and subsequent presentation. It must be appreciated that living cells are less easily photographed than fixed cells. They rarely lie in a horizontal plane, so that while one portion of a cell is in focus the rest appears distorted and hazy. Because living cells are three-dimensional it is to be expected that inconsistencies of structure at

the plane of photography are more apparent than real, and that this type of photography can reproduce only that which is observed at a given moment in a limited plane of the cell. The movement of bacteria and shifting debris, undulations of cilia, shifting of cytoplasm and granular particles, in addition to the very rapid Brownian-like movement observed in some cells, add to the difficulties of obtaining accurate reproductions. Because cells may overlie each other the resultant picture may not always be as clear as in a fixed preparation. apparent therefore that the only means of determining the true cytological characteristice of any of these cells is by direct visual observation, and that the closest approximation to this ideal can be achieved only with the aid of cine-photography.

#### OBSERVATIONS.

At this stage of our investigations it is not intended to lay down specific features by which the identity of the various cells which may occur in the mucosal layers of the gynaecological tract may be established. On the other hand cells have been selected to show details which appear to be characteristic of a particular type of tissue but without regard to physiological variations in the structures from which the tissue is derived. In the case of malignant lesions, or at least in the cells derived from tissues of proved malignancy, those stigmata by which they may be broadly differentiated from normal cells will be indicated. Nevertheless, no specific criteria of malignancy have been established at this juncture.

### A. Non-Malignant Cells.

Vagina. The cells derived from the layers of the vaginal wall show variation in size, degree of curling, shape and structural appearance comparable to those observed in stained smears or unstained prepara-

tions where variable light factors are applied. Here, however, without staining, fixation or alteration of light, the identification of cell structures is easily accomplished. Deep cells of the vaginal wall present no greater difficulty than the superficial epithelium. Extra-nuclear squamous bodies and the granular cytoplasm of the cells are easily identified (Figs. 1 and 2). Nuclear membranes and structures are especially prominent in some cells and the former frequently show flattening of their surfaces, giving them a cube-like appearance. Within the nucleus solid threads and chromatin lumps can frequently be seen. The ratio of nucleus to cytoplasm varies in different specimens of the normal cycle (Figs. 1 and 2), and in pregnancy (Fig. 3). Direct comparisons of size can be made here between cells without regard or allowance for such variable factors as shrinkage induced by fixation and staining. Various bacterial, parasitic and fungoid contaminants may be seen, when present, at the same time that vaginal squames are being observed.

Cervix (Squamous). Teased preparations of healthy cervix will show cells from the deeper layers of the squamous epithelium. Basal cells (Fig. 4) are smaller than the intermediate cell forms (Fig. 5). The discrepancies in size and structure of these cells are compatible with their respective sites of origin. The more superficial the cell the greater is its size and the more easily is cytoplasmic and nuclear detail visible. In teased preparations such as this, where individual cells have not become detached. cell outlines are difficult to define, but the nuclear membranes are very sharp and stand out in bold contrast to the surrounding cytoplasm.

Cervix (Columnar). The epithelium of the endocervix is easily recognized by the large and uniform size, shape and structure of the cells and their nuclei. The nuclei are all situated in the same relative position of the cell, and they are very prominent by virtue of their distinct membranes. Figs. 8 and 9 show such cells which were obtained from benign endocervical polyps.

Endometrium (Epithelial). It could be anticipated from a knowledge of the variations in the character of endometrial epithelium as observed in the stained preparations that the cells observed with phast-contrast microscope would show great diversity of form and struc-These variations exist to perhaps a greater extent than those shown in paraffin sections, since less clumping and distortion of granules in cytoplasm and nucleus occurs in fresh specimens unaltered by shrinkage and precipitation. Figs. 12-19, inclusive, are from endometria of uteri which have been removed at or about the climacteric for benign bleeding.

When cells are observed "en masse" only the nuclear membranes are prominent (Fig. 12). Cell outlines are not readily defined, and therefore the relative position of the nucleus is not easily determined. As the individual cells tend to separate in the fluid medium (Fig. 13) so do their outlines become more distinct and the cells now appear to be larger in size and their nuclei more distinct, since there is no overlap of cell margins.

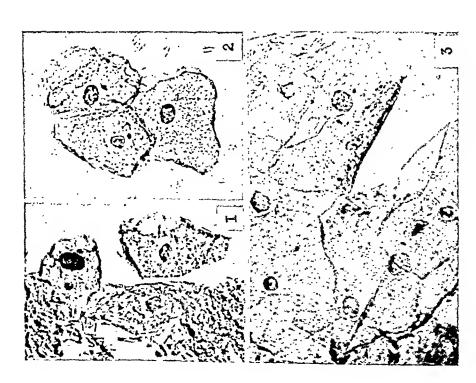
Gland epithelium shows variation in the position of the nucleus relative to the stage of the menstrual cycle at which the endometrium was obtained and, in addition, the shape of the cells, their size and the amount of secretion vary similarly to those observed in paraffin sections. These variations are illustrated in Figs. 13, 14, 15, 16, 17, 18 and 19. In some cells secretory globules can be seen lying either behind or in front of the nucleus. Movement of very fine granules is a distinctive feature of some cells, and localization of an exceedingly rapid movement is confined to a

small, well-circumscribed area away from the nucleus. This movement is akin to Brownian movement but appears to be more rapid, and instead of moving in short straight lines the particles describe circular patterns. In Fig. 18, small, discrete, translucent spaces or vacuoles other than the secretory globules previously alluded to, are visible in the cytoplasm. Nuclei generally possess very sharply defined membranes along which clumps of chromatin are visible. This is seen exceptionally well in Fig. 14, a ciliated endometrial epithelial cell obtained from a uterus which had been removed by vaginal hysterectomy without removal of Fallopian tubes.

An incidental finding in our endometrial tissues was a group of *Trichomonas*. These occurred in a uterus which had been removed above the level of the internal os.

Endometrium (Stroma). The stromal cells of endometrium are more abundant in these preparations than are epithelial cells. While there is also wide discrepancy in the size of stromal cells in different specimens, those cells obtained from a particular specimen are approximately the same size and shape. They are round and are usually clumped together (Figs. 10 and The cytoplasm contains dark and light areas of varying opacity, but its bulk is composed of solid granules of large size. The outline of the cells is less prominent than is the nuclear membrane. nucleus is large and has a conspicuous membrane with well-defined nucleoli and linin threads.

fallopian Tube (Epithelium). The most distinctive and easily recognized cells in the tube are the ciliated epithelium (Fig. 22). In very fresh specimens the co-ordinated rhythmic movements of the cilia are capable of setting up forceful currents in the surrounding fluid and occasionally the cells set themselves off in motion. As in the other columnar and cuboidal cells pre-



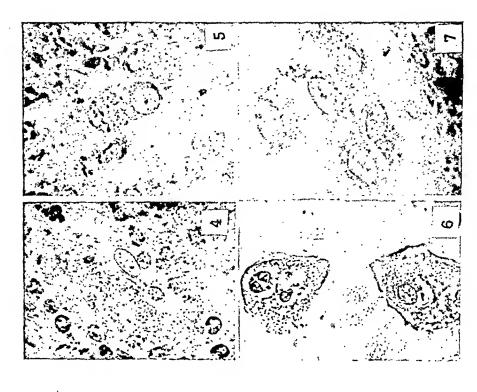
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Fig. 1. Normal vaginal squames, Bacterial clumping also

present.

Normal vaginal squames. Vaginal squames in early pregnancy. Fig. Fig.

A.C. & J.G.



Cervix—intermediate cells.

5. Cervix—intermediate cells.
6. Cervical squames showing binucleate cell and extranuclear bodies. FIG. 4. Cervix—basal cells. FIG. 5. Cervix—intermediat FIG. 6. Cervical squames s

Fig. 7. Cervix—desquamated intermediate cells.

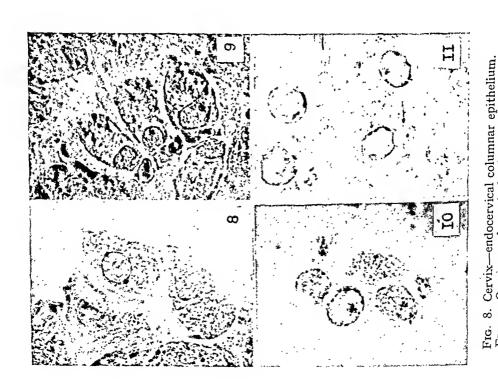
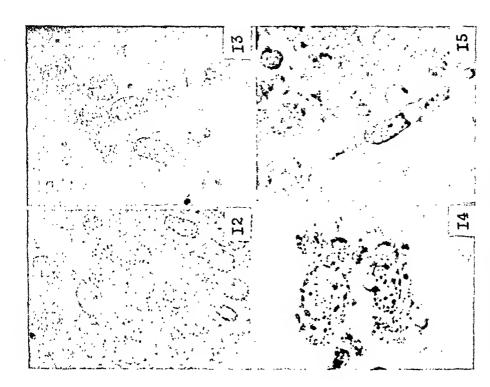


Fig. 9. Cervix—endocervical columnar epithelium.

Fig. 10. Endometrium-stroma cells. Fig. 11. Endometrium—stroma cells.

A.C. & J.G.



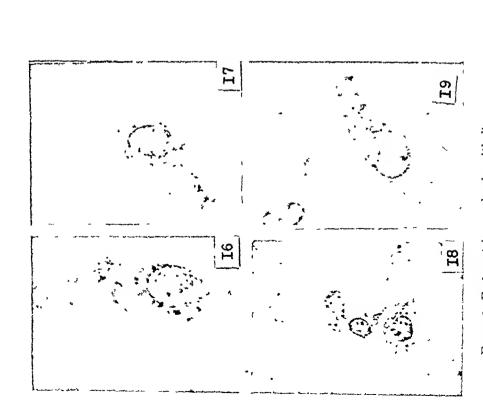
Endometrium—epithelial cells. FIG. 12.

Endometrium-epithelial cells.

Endometrium—epithelial cells. Cilia are prominent. Endometrium—gland epithelial cell showing Fig. 13. Fig. 14.

Fig.

secretory globule.



Endometrium—gland epithelium. Fig. 16. 1 Fig. 17. 1 Fig. 18. 1 Fig. 19. 1

Endometrium—gland epithelium.

Endometrium—gland epithelium. Endometrium—gland epithelium.

Pus cell and endothelial cells. Pus cells.

Ciliated epithelium of the Fallopian tube. Cervical squames—post irradiation. Fig. 20. I Fig. 21. I Fig. 22. ( Fig. 23. (

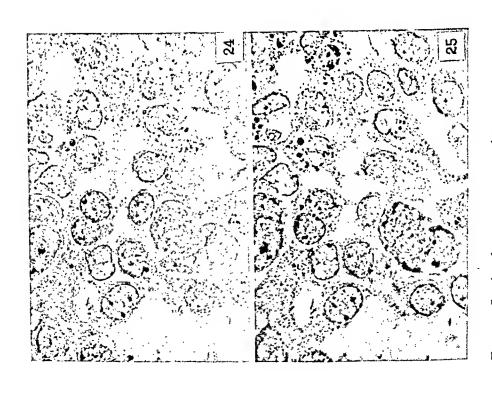


Fig. 24. Cervix—from squamous carcinoma. Fig. 25. Cervix—same as Fig. 24 but photographed at different plane.

A.C. & J.G.

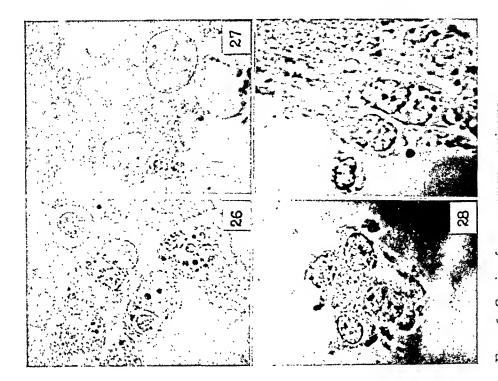


Fig. 26. Cervix—from squamous carcuroma.

Fig. 27. Cervix—from same case as Figs. 24 and 26, but

following irradiation.

Endometrium—from carcinoma of the fundus.

Endometrium—from carcinoma of the fundus. Fig. 28. Fig. 29. viously described the cell outlines, nuclear membranes and cell constituents are prominent and in many respects are similar.

Miscellaneous (Polymorphonuclear Leucocytes). Pus cells frequently occur in the genital tract and for that reason they have been included in this presentation of cell types. They are very easily identified by the presence of large lobulations (Figs. 20 and 21), within each cell and by the intense movement of the extra-lobular galaxy of granules. This movement within pus cells is greater and more widespread through each cell than that observed in any other type so far studied. The pseudopodic movements, undulations of cell membranes, phagocytosis, shift of protoplasm, granules and nuclei are all very distinct visual phenomena but obviously cannot be reproduced here. In fact, the cells illustrated in Figs. 20 and 21 show no granules whatsoever because the latter are moving too rapidly for photography.

We have shown and described, so far, certain of the salient features that can be seen in the examination with the phasecontrast microscope of cells derived from representative areas of the gynaecological tract. Generally, there is not a great deal of difference in the size of cells in a particular tissue, with due consideration for the histological level from which the cells were obtained. In other words, while the basal cells of the cervix are much smaller than the intermediate cells and these in turn are smaller than the superficial squames, all of the basal cells are closely allied in size, shape and structure and the same applies to the intermediate and superficial cells. In comparing endometrial epithelial cells of different uteri, wide variations in size are noted, but these features, like the position of the nuclei, the amount of secretion, and the activity of the granules, are within the normal range if due regard be given to physiological influences. We are aware of

the fact that many of the variations observed in cells of a particular type maye be due to such influence as temperature, elapsed time since removal from the patient, and intrinsic environmental states of the tissue. As these factors are of little consequence in preventing our recognition of main cell types and the consistencies amongst them, emphasis has not been placed here upon individual features if they occur within the apparent limits of normalcy.

### B. Malignant Cells.

Cervix (Squamous). The range in the size and structure of cells obtained from carcinoma of cervix is so great that identification of malignancy is a simple matter in such clear-cut instances (Figs. 24, 25 and 26). Mitotic figures, very large nuclei and binucleate forms, irregular granules and chromatin clumps with destruction and irregularities of cell membranes are much in evidence. Within many cells the movement of granular particles is apparently haphazard and lacks the localization observed in normal cells. In some cells numerous, small, translucent globules of fat are a prominent feature.

Figs. 24 and 25 are of the same field but photographed at different planes to show apparent differences of cell structure. This case was treated with radium and a week following the first application a further examination of the cells was made. There was gross destruction of many cells (Fig. 27). Very few now showed distinct nuclear and cytoplasmic detail and since cell destruction is widespread the effectiveness of the radium, as judged in this way, appears to be very satisfactory. Fig. 23 shows cells from another carcinoma of cervix following radiation therapy, but here there has been very little, if any, alteration in the character of the cells. It has been mentioned that binucleate forms occur in cells from malignant cervices. Such cells have also been observed in chronic cervicitis (Fig. 6), but the relation of these cells to malignancy has as yet not been established. Chronic cervicitis may shed cells of the intermediate type, but where the cells are as uniform as those represented in Fig. 7 they must be regarded as benign cells.

Endometrium (Epithelium). In endometrial carcinoma the sharpness of cell outlines is lost and there is clumping of the cytoplasm (Fig. 28). Abnormal nuclear forms may be recognized (Fig. 29). The size and the degree of cell differentiation may be exceedingly variable. Lack of cell uniformity in regard to size, nuclear configuration and granular components renders the recognition of malignancy relatively easy.

Malignancies of cervix and endometrium are recognized, therefore, not only by the wide and specific anomalies among their individual cells, but also by virtue of the discrepancies they betray in comparison with their counterparts in normal cells. That the criteria for malignancy shall have to be based on such broad features is beyond question since cells lying out of position and unrelated to contiguous tissues cannot present those features of loss of polarity and invasion upon which some present standards of malignancy are based.

# DISCUSSION.

From these observations and comments it is apparent that a new and valuable method for the study of fresh tissue cells in the female genital tract is now available.

Whereas detached living cells have previously been observed with ordinary microscopes, they do not lend themselves easily to study, because of lack of definition and poor contrast of nuclear and cytoplasmic structures. These studies have generally been made upon essentially

non-gynaecological material by cytologists whose interests have been rarely in direct line with those of the clinician. The expert cytologist still requires to stain such cells, if only with vital dyes such as Janus green or neutral red, in order to identify and differentiate cell types. Such techniques, in turn, introduce variable factors, for, unless the observer is especially skilled, artefacts induced by the dyes may complicate the picture still further. For these reasons recourse to stained fixed sections of suspicious tissue subjected to biopsy is the only reliable alternative for the diagnosis of potential malignancy. The persistent desire to study cells in as fresh a state as possible, and as early as possible without the delay inherent in wax techniques, undoubtedly led to the perfection of the method of the stained vaginal smear. addition these procedures obviate the necessity for hospitalization of patients in order to incise tumour tissue. Here again special staining techniques and a thorough cytological training are pre-requisites for a satisfactory interpretation of material obtained from the gynaecological tract.

With the advantages of the application of new physical principles to the construction of the microscope, observations with this instrument can be made now upon cell structures before they have been altered by fixation and staining. These physical and chemical factors obviously affect the morphology of such cells and thus distort, albeit uniformly and consistently, visual impressions of histological and pathological processes. While this microscope appears to be ideal for studying cell cytology, cells removed from their environment in the tissues provide a task for their recognition requiring a great deal of experience. Since these cells obtained from the genital tract are seen in as fresh a state as possible and without the addition of physical or chemical agents, it is apparent that the structure of

these cells will present appearances not in complete accord with fixed and stained specimens obtained by smear, paraffin block or frozen section. Because of this it is necessary to formulate, as it were, a new set of criteria for recognizing the cell constituents of each tissue and our investigations are planned with this intention.' Criteria for malignant cells will also differ from those for fixed tissues. Therefore, only when sufficient experience and data concerning these cells have been acquired will the accumulated knowledge be applicable to routine diagnostic problems. The technique is consequently not immediately applicable to the routine diagnosis of malignancies. Obviously there will be border-line cells and malignant cell precursors whose recognition will require the knowledge and greater experience of the expert. For the frankly malignant cell, however, such high proficiency in diagnosis is not so necessary.

In this report we have shown cells from the mucosa of vagina, uterus and appendages as they appear with the phase-contrast microscope. We have designated some of the features and characteristics of particular cells which, it is our opinion, will eventually be included in establishing specific criteria for such cells.

It is anticipated that with further investigations and the consequent elaboration of criteria essential to accurate diagnosis, this technique will be applied to the study and diagnosis of early exfoliative malignancies as well as to the less vital analysis of infections and hormonal disturbances as manifested in the gynaecological tract. An important advantage of the method lies in the fact that several examinations can be performed in a very short space of time and successive areas of cervix may be examined

without undue inconvenience and without the necessity of repeated interviews with the patient. Since most carcinomas of the uterine corpus are exfoliative lesions the diagnosis of many of them should be possible by examination of fluid from the endocervical canal. In their recent monograph Papanicolaou and Traut (1943) have shown the feasibility of this by the stained vaginal smear technique. When the various patterns of endometrial carcinoma as revealed by the phase-contrast microscope have been established, the immediate early diagnosis of corpus carcinoma should be possible in many cases.

### Conclusions.

The phase-contrast microscope has an immediate, direct use in the study and diagnosis of gynaecological tissues obtained by aspiration, curettage or smear. Because such tissues can be observed and studied while the patient is being examined clinically, and because these tissues require no fixation or staining in order to show greater details of cell structure than by any other method in current use, it is considered that application of the instrument should constitute a significant advance in the early recognition of cancer.

We are indebted to Professor O. S. Heyns and Dr. C. F. Krige and their Assistants for their co-operation in making available to us much of the material used in this study, and to Dr. Joseph Gillman for his valuable support and criticism.

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# PROCIDENTIA COMPLICATED BY INTESTINAL STRANGULATION IN A POUCH OF DOUGLAS HERNIA

BY

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STRANGULATION of the contents of the sac of an intact enterocele must be rare, as a search through the literature has failed to reveal a recorded case. It is true that an instance was reported recently (Daley and Callum, 1946), where a loop of gut had herniated through a perforation in the posterior vaginal wall of a procidentia and become gangrenous, but in that case the point of constriction lay in the vaginal perforation and the gut was visible, whereas in the case to be reported the constriction lay at the entrance to the pouch of Douglas, the strangulation being an internal one.

#### CASE HISTORY.

A married woman, aged 50 years, was admitted to Saint Mary's Hospital as an emergency on 31st July, 1947.

She had had 2 deliveries at term, both forceps extractions, the last 22 years ago. The menopause had occurred a year ago.

She had an appendicectomy performed 26 years, and a right inguinal herniorrhaphy 25 years previously.

The patient described her "womb coming right outside" for the last 7 years, but she was always able to replace it herself and no treatment had ever been sought. Forty-eight hours before admission she vomited once and the "womb came down", but this time she was unable to correct it. There was no further vomiting, although nausea was present, but she complained of a severe aching pain in the hypogastrium and right iliac fossa, although this was never colicky in type. She was having difficulty in micturition since the womb had become irreplaceable, small amounts of urine being passed at frequent intervals.

The patient was a slightly built woman, not very intelligent and rather deaf, a combination which made the taking of her history and assessment of the severity of her symptoms difficult. She appeared to be anaemic and her fingers showed koilonychia. There was a persistent but not severe hiccough. Her tongue was normal in appearance.

The abdomen showed slight gaseous distension. There was a soft swelling over the site of the old hernial repair, which showed no impulse on coughing and was only slightly tender. She said that this had been present for years and was no different now from what it had been previously. The old right gridiron scar was well healed. There was some vague tenderness in the hypogastrium, but not marked and the patient did not appear to be having much pain at this time. Normal peristaltic movements were heard.

There was a large, oedematous procidentia. By steady pressure this was gradually replaced, although there was some pain produced during the last part of the reduction which improved, but was not abolished, when reduction was completed. As soon as the pressure was released, however, the procidentia re-established itself, even though the patient was not straining, so it was replaced and held in situ by a cup and stem pessary, a ring proving ineffectual.

The heart and lungs were normal and the blood-pressure was 160/90. There was no pyrexia.

The blood urea was estimated at 153 mg. per 100 ml. A catheter specimen of urine showed a faint trace of albumin and a mixture of organisms. (These were later established as being diphtheroid bacilli, coagulase-positive staphylococci and a few coliform bacilli). The white-cell count was 15,900 per c.cm., of which polymorphonuclear leucocytes represented 81 per cent.

We made the tentative diagnosis at this time of

ore-uraemia due to chronic urinary obstruction caused by the procidentia, but we were not by any means satisfied. The fact that the uterus was no longer replaceable without difficulty, and that when replaced the prolapse recurred at once, was ouzzling, and the moistness of the patient's tongue lid not fit our diagnosis.

It was decided to observe her and see if her condition improved with the uterus held in place by the cup and stem pessary.

A glucose-saline drip was started.

During the rest of the day and night she vomited 3 or 4 times but not copiously and there was little change in her condition. The pulse-rate remained nigh, at about 120 or higher. Although the liagnosis of obstruction was now under consideration, with adhesions from the old appendicitis or the inguinal hernia as the most likely cause, the absence of colicky pain and the slight degree of distention and vomiting were against this diagnosis. Pre-uraemia and peritonitis due to the infected procidentia were alternative diagnoses.

Next day, 1st August, 1947, there was still little change in the patient's condition except that vomiting occurred again, although still not as a marked symptom, while distension and pain were no worse. Peristaltic sounds were now more marked. We called Mr. Thompson from the Manchester Royal Infirmary in consultation and it was decided to take a straight X-ray to confirm the diagnosis of obstruction. This showed several fluid levels and small gut obstruction was diagnosed.

Laparotomy was performed under heavy spinal anaesthesia by Mr. Thompson and distended coils of small gut were seen at once. These, when followed, led to a constricting ring behind the uterus, large enough only to admit one finger. This was the entrance to the pouch of Douglas. The ring was opened digitally and a coil of small intestine delivered which was gangrenous for the distance of about 1 inch, so resection and end-to-end anastomosis were performed. Penicillin solution (100,000 units in 10 ml.) and penicillin and sulphathiazole powder were put into the peritoneum. The drip was continued and the cup and stem pessary kept in situ.

Continuous gastric suction was set up in the ward, saline and glucose-saline alternated in the drip, and chemotherapy was maintained.

Despite coramine and oxygen, the patient became steadily more comatosed and died on 3rd August, 1947—30 hours after operation.

Postmortem examination was refused.

#### DISCUSSION.

There are two points which may be made in connexion with this case. One is the relatively "silent" nature of the obstruction, particularly remarkable as it involved small gut. Neither vomiting, distension nor pain were marked. Secondly, even when the obstruction was diagnosed, the true cause of the strangulation was overlooked, we still thought of it in connexion with an adhesion, or the old hernia. (The latter had been a "red-herring" throughout.) There was a pointer to the true diagnosis whose significance was overlooked at the time. namely that the patient had had a replaceable procidentia for years, and that then suddenly it became irreplaceable by the patient herself; moreover, when we replaced it, immediate recurrence took place.

The rarity of this complication of enterocele is due, no doubt, to the normally wide opening into the pouch of Douglas, and we were unable to establish whether there was any special reason for the narrow neck discovered in this case.

I would like to thank Professor Dougal, under whose care this case was admitted, for permission to publish this report.

#### REFERENCE.

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# HYSTEROSALPINGOGRAPHY EMPLOYING A WATER-SOLUBLE CONTRAST MEDIUM

BY

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A REPORT on the use of a water-soluble contrast medium in the radiological investigation of pathological conditions involving the female pelvic viscera has already been published (Jefferiss and Samuel, 1946). Certain changes have been made in the technique formerly employed, but the general principles remain the same.

A Lietch-Wilkinson catheter has been used lately in place of the Spackman's catheter, and novocaine has been omitted from the solution, as it served no useful purpose.

During the course of investigation of pelvic tumours it has been our practice to use this method of hysterosalpingography in the investigation of female infertility.

Rubin (1947) states that he has used a large number of radio-opaque substances in radiological examination of the Fallopian tubes. He has chosen his compounds for viscosity combined with rapid absorbability.

It is contended that any radio-opaque substance used in testing the patency of the Fallopian tubes must fulfil certain criteria. It is submitted that these are ease of introduction, easy visibility under the screen, non-irritability to the epithelium of the Fallopian tubes and peritoneum, and rapid absorption from the tubes and peritoneum. We are using "Pyelosil", a 35 per cent solution of the diethanolamine salt of 3:5-di-iodo-4-pyridone-N-acetic acid and it appears to fulfil all these criteria.

This compound is easy to introduce, requiring very little pressure to achieve introduction into the uterus and Fallopian tubes; in fact in the presence of patent tubes it is necessary to use less force than is required for ordinary subcutaneous injection. Providing the operator takes care to wait until he is accommodated to the fluorescent screen he will have no difficulty in observing spill into the peritoneum through the fimbrial ends of patent Fallopian tubes, or the gradual dilatation of blocked tubes. For permanent record it is important that the films be exposed at the moment indicated by the conditions seen on the screen, since Pyelosil is rapidly diffused over the peritoneal surface and is rapidly absorbed. For investigation of the patency of tubes this quick diffusion is of no importance since a picture showing radioopacity spread over the pelvic peritoneum is ipso facto proof of spill from at least one tube. Fig. I shows an example of normal tubal patency.

Whether Pyelosil is likely to cause mechanical obstruction by irritation of the tubal epithelium has not yet been proved, but we have not found evidence of this. The solution is absorbed within an hour of introduction and can be seen in the ureters and bladder after excretion by the kidneys. It is, of course, possible that adhesions may be caused, but we have had 2 cases of pregnancy following its use even in the short time which has elapsed since the investiga-

tion started. It would appear doubtful that much trauma could be caused in the few minutes the substance is in the tubes and pelvic peritoneum. Lipiodol remains in the peritoneal cavity for a considerable time and we have been told of one case in which it was still visible 20 years after the original injection. Lipiodol is known to cause adhesions in the spinal theca and no evidence has been offered to show that it does not do so in the Fallopian tubes, Rubin emphasizes the foreign body reaction to iodized oils.

It is claimed by the advocates of lipiodol that the presence of spasm at the ampullary end of the tube can be demonstrated by the appearance of dye in the peritoneal cavity 24 hours after the introduction. It is our experience that, when using lipiodol, this delay in spill is the rule rather than the exception and is more likely to be due to viscosity of the fluid than to spasm of the tube. Using Pyelosil it is not possible to obtain a delayed picture since the compound is absorbed completely at the end of an hour. From our present small series we have picked out one case (Fig. 4) in which spasm had to be eliminated and this was done by repetition of the injection. Even if a definite answer cannot be found without laparotomy in a small number of patients, it is considered that the absence of danger to the patency of healthy tubes outweighs any advantage claimed for a more slowly absorbed substance.

Twenty-four infertile women have been subjected to hysterosalpingography after the male partners had been found normal. The results are listed below.

State	Year	Total		
	Under 5	5-10	10 or over	cases
Patent	14	5	0	19
Blocked	2	2	I	5

This also gives the duration of infertility based on the years of effective marriage; periods when contraceptives have been used or when one or other partner has been absent have been subtracted from the actual years of marriage.

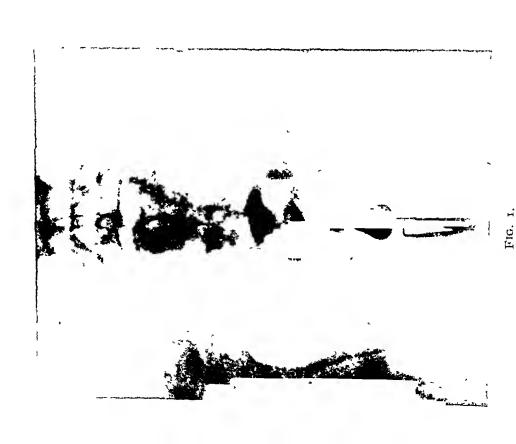
The figures show (1) patent tubes, (2) hydrosalpinx, (3) pyosalpinx, and (4) obstruction at the ampullary end (later shown to be due probably to spasm). Of the 5 cases of obstruction 3 patients have so far been submitted to laparotomy and have shown anatomical obstruction due to pyosalpinx in 2, and tuberculous salpingitis in one.

No therapeutic benefit is claimed in the use of Pyelosil in the investigation of tubal patency. It is questionable whether any form of utero-tubal insufflation is likely to be of benefit in any but the most recent cases of anatomical obstruction. Insufflation should be carried out within 10 days of laparotomy for ectopic gestation or for salpingostomy or partial salpingectomy, so that recent fine adhesions may possibly be separated. have the doubtful advantage of working in a hospital with a long waiting list of urgent, semi-urgent and non-urgent cases. was salutary to note the number of patients, who became pregnant while awaiting admission for insufflation of the Fallopian It is possible that these women would have been claimed as successes for our treatment if we had been able to get at them earlier. It may be added that the period of waiting for non-urgent cases is up to a year. Further cases of this sort are not likely to arise in the immediate future. since radiological methods are now used as an out-patient or office procedure and waiting is not required.

In conclusion, an apology is offered for the small number of patients in the series. This is due partly to the principle that it is unfair to submit a woman to even this mild ordeal until her male partner has been fully investigated (if this is refused salpingography is not performed), and we consider an early, if brief, report may serve to encourage others to use watery solutions in salpingography, and perhaps to find better compounds than Pyelosil for this purpose. Thanks are due to the honorary gynaecological and radiological staff of the Middlesex Hospital for permission to carry out this investigation.

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Patent Fallopian tubes. Spill of the dye is seen in the pouch of Douglas and over the pelvic peritoneum.

Fig. 2.

Hydrosalpinx. Note the extreme dilatation of the Fallopian tubes which caused no discomfort to the patient. The uterus is nearly emptied of the dye which has flowed easily into the already dilated Fallopian tubes. Films taken with this patient lying on her side show distinct fluid levels. Examination 2 weeks later gave an exactly similar picture. On vaginal examination nothing abnormal was felt but after introduction of the dye the dilated Fallopian tubes could be palpated behind the uterus.

D.J.



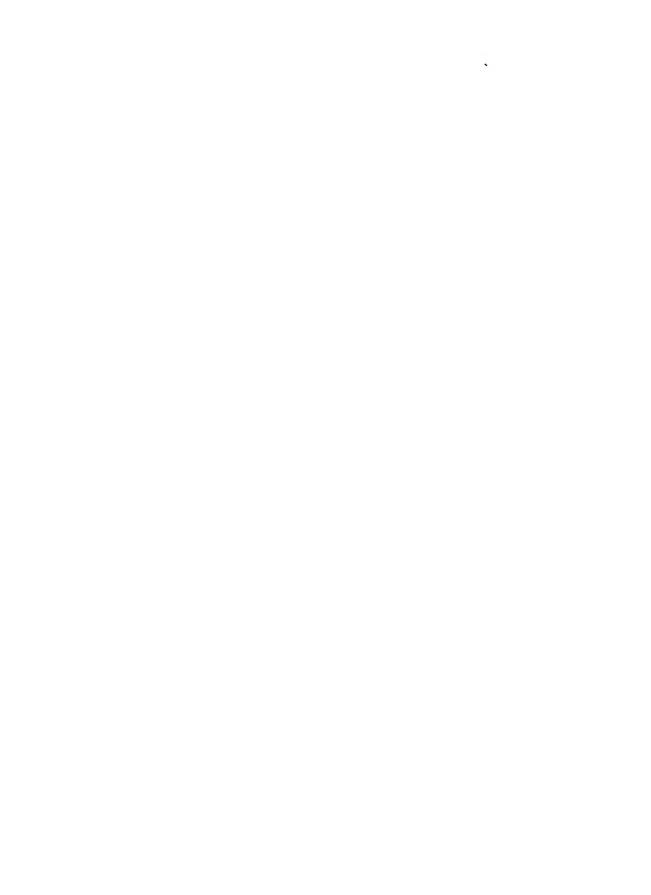
Fig. 3.

Pyosalpinx. An antero-posterior view taken with the patient lying on her left side to show fluid-levels. At operation bilateral pyosalpinx was found.



Fig. 4.

Spasm or temporary blockage at the ampullary end. Apparently normal Fallopian tubes as far as the ampullary ends where there is moderate dilatation and no spill. A second examination gave a similar result at first but after 30 ml. of Pyelosil had been introduced there was a sudden marked lessening of resistance to the plunger of the syringe and spill occurred from the left Fallopian tube.



# INACTIVATION OF OESTROGENIC HORMONE BY WOMEN WITH VITAMIN B DEFICIENCY

BY

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It has been demonstrated both in vivo and in vitro that the liver and, to a lesser extent, the spleen and perhaps the kidney are the only organs in the body which can inactivate the oestrogenic hormone (B. Zondek, 1934a, 1934b, 1935, 1941, 1946; Zondek and Sklow, 1941).

Recently it has been claimed (Biskind and Biskind, 1942) that oestrogen inactivation is dependent on the adequate intake of vitamin B complex. Furthermore, it has been assumed that a deficiency of vitamin B complex deprives the liver of its ability to inactivate endogenous and exogenous The hyperoeoestrogenic substances. stronaemia thus presumably induced has been suspected of being implicated in various disorders of genital function in women (Biskind, 1943). Excessive uterine bleeding with glandular hyperplasia, cystic mastitis and even the formation of uterine myoma have been ascribed to impairment of the mechanism of inactivation of oestrogenic hormone, due to vitamin B deficiency. It has further been claimed that treatment with vitamin B complex relieves the above disorders (Biskind, Biskind and Biskind, 1944).

During the war an opportunity to study genital function in patients suffering from vitamin B deficiency was afforded in this country. During this period cases of vitamin B deficiency marked by glossitis, cheilosis, angular stomatitis and ocular disorders (corneal vascularization) due to ariboflavinosis, as well as pellagroid changes of the skin and glossitis due to nicotinic acid deficiency were observed in Palestine with unusual frequency. These manifestations resulted both from insufficient dietary intake and from inadequate resorption of essential nutrients due to the disturbances of intestinal function (such as chronic dysentery, amoebiasis, etc.) which are common in this country.

The symptoms of vitamin B deficiency were especially common in pregnant women (Braun, Bromberg and Brzezinski, 1945). Since pregnancy occurred in patients suffering from vitamin B deficiency and, nevertheless, took a normal course, we concluded that vitamin B deficiency apparently has no harmful effect on the genital functions.

Out of the great number of cases available we have selected for our study 14 patients in whom there was very marked evidence of deficiency in vitamin B complex. The experiments were designed to determine whether vitamin B deficiency plays any role in the inactivation of the oestrogenic hormone.

# MATERIAL AND METHODS.

The patients studied were 14 women of childbearing age, between 19 and 41, with pronounced manifestations of vitamin B deficiency. They were divided into 3 groups (Tables I to III).

Group A. Women menstruating regularly, with evidence of vitamin B deficiency (6 cases).

Group B. Patients in whom symptoms of vitamin B deficiency occurred during pregnancy (6 cases: r in the 5th, r in the 6th, r in the 7th, 2 in the 8th, and r in the 9th month of pregnancy).

Group C. Patients in whom symptoms of deficiency appeared during pregnancy and were complicated by severe infectious hepatitis with jaundice and other manifestations of extensive liver damage (2 cases: 1 in the 4th and 1 in the 7th month of pregnancy).

The riboflavin deficiency was persistent and was associated with the following signs: (r) Clinical symptoms: glossitis, cheilosis, angular stomatitis and corneal vascularization. (2) Laboratory observations: persistent low level of riboflavin excretion in the urine (less than 100γ per litre; normal value = 400γ to 500γ per litre).

Evidence of nicotinic acid deficiency associated with ariboflavinosis, glossitis and pellagroid skin changes of both the upper and the lower extremities was observed in 6 cases. In 2 cases the ariboflavinosis was associated with symptoms of thiamine deficiency such as polyneuritic manifestations and unusually high excretion of pyruvic acid in the urine.

The oestrogen metabolism of the patients was studied with the aid of vaginal smears, endometrial biopsy, oestrogen determination in blood and urine, and the oestrone

clearance test (according to the method of Zondek and Black, 1947\*).

### RESULTS. †

Group A. Regularly menstruating women with vitamin B deficiency.

- (a) Clinical histories. The clinical histories of the 6 adult women in Group A presented no evidence of abnormality of genital function. All the patients menstruated at regular intervals or from 26 to 31 days. In all cases the menstrual flow was normal both in amount and in duration.
- (b) Physical examination. No evidence of excessive production of oestrogenic hormone was observed on physical examination. No cases of enlarged uterus, cystic follicles, or cystic mastitis were observed.
- (c) Endometrial biopsy. In all 6 cases the endometrial biopsy, performed shortly before menstruation, showed the normal histological picture characteristic of the progestational stage. These findings proved that ovulation and corpus luteum formation and the response of the endometrium to the hormonal stimuli were normal in every case.
- (d) Vaginal smears. In vaginal smears, taken according to the technique described by Papanicolau, cells characteristic of hyper-oestrogenic activity were not found.

<sup>\*</sup>Oestrone clearance test. The patients are injected intramuscularly with 125,000 M.U. of oestrogen. The urinary oestrogen titer is determined on 3 successive days. The total oestrogen clearance is estimated in terms of oestrogen excretion over the pre-injection level and expressed as a percentage of the injected amount. The normal excretion of the injected oestrogen averages from 0.5 per cent to 4.5 per cent.

<sup>†</sup> Two typical case reports are presented in every group.

- (e) Oestrogentitration in blood and urine. The oestrogen levels of blood and urine were normal (less than 50 M.U. per litre serum and less than 200 M.U. per litre urine).
- (f) Oestrone clearance test. Oestrone 125,000 units were injected intramuscularly into 2 women with vitamin B deficiency. The blood oestrogen levels and the urinary excretion of the hormone were studied. Inactivation of oestrone occurred in these cases at the same rate as in normal women without any sign of vitamin B deficiency.

#### TWO CASE REPORTS.

Case No. 3. A married woman, 31 years old, consulted us for the relief of excessive vaginal discharge. She had undergone 3 normal pregnancies and deliveries. Her menstrual cycle lasted for 30 days and the flow for 3 to 4 days. On gynaecological examination a normal-sized, retroflexed uterus was observed, with severe inflammation of the cervix and vaginal mucosa. No other gynaecological disturbances were found. The patient's general history revealed a long period of undernourishment. On physical examination striking manifestations of vitamin B deficiency were found. The patient appeared undernourished, pale and tired, and suffered from glossitis, cheilosis and stomatitis. She complained of a burning sensation in the eyes and in the upper part of the tongue. Ocular examination by split-lamp revealed pronounced corneal vascularization. The urinary riboflavin excretion was very low: 80 to 1007 per litre. In an endometrial biopsy, performed premenstrually, a normal progestational uterine mucosa was found. The vaginal smear reflected normal endogenous secretion of oestrogen. Less than 120 M.U. of oestrone per litre of urine and less than 25 M.U. per litre of blood serum were found. The oestrone clearance test revealed a normal recovery of oestrone in the urine (o.5 per cent).

Case No. 5. A married woman, 21 years old, consulted the medical out-patient department for the relief of general fatigue, abdominal pain and diarrhoea lasting for several months. The patient had been married for 4 years, and had had 2 normal deliveries, the last one a year previously. The menstrual history was normal (26-day cycle

with normal 3-day flow). No gynaecological disorders were found. The patient complained of nervousness, fatigue, pain and a burning sensation in the tongue and the upper part of the oesophagus. On general examination the characteristic features of nutritional deficiency, glossitis, angular stomatitis, seborrheic accumulations in the naso-labial folds and pellagroid changes of the skin were found. Ocular examination revealed severe corneal vascularization. Excretion of riboflavin in the urine was low, 75 to 95y per litre. The pyruvic acid level of the urine was 280 mg. in 24 hours (normal: up to 180 mg. in 24 hours). Cells characteristic of oestrone hyperactivity were not found in a vaginal smear. (Endometrial biopsy during the premenstrual phase revealed a normal progestational stage. Two hundred M.U. of oestrogen were excreted per litre of urine and 33 M.U. of oestrogen were demonstrated per litre of blood serum. The recovery of oestrone in the urine in the oestrone clearance test was normal, 0.5 per cent.

# Group B. Pregnant women with vitamin B deficiency.

The clinical histories of the 6 pregnant women in this group revealed that in 2 of these cases deficiency syndromes had been present for at least 1 year (cases 8, 10).

Oestrogen levels in blood and urine were no higher than in corresponding months of normal pregnancy.\* The Oestrone clearance test showed normal inactivation of injected oestrone.

#### TWO CASE REPORTS.

Case No. 8. A married woman, aged 26 years, attended our prenatal clinic in the 7th month of her second pregnancy. The patient had the following definite signs of nutritional deficiency, glossitis, cheilosis and stomatitis. She complained of a

<sup>\*</sup>The normal values of oestrone in the blood during pregnancy are: 50 to 100 M.U./L. for the 1st and 2nd months, 100 to 800 M.U./L. for the 3rd to 7th months, and 800 to 1,500 M.U./L. for the 7th to 10th months. The normal values of oestrogens in the urine during pregnancy are: 300 to 600 M.U./L. for the 1st and 2nd months, 5,000 to 7,000 M.U./L. for the 3rd to 7th months, and 6,000 to 20,000 M.U./L. for the 7th to 10th months.

burning sensation in the whole buccal cavity, extreme fatigue and pain in the legs, especially at night. The patient stated that most of these signs had appeared prior to the present gestation, but had been aggravated since the 7th month of pregnancy. A moderately developed corneal vascularization was found. Urinary riboflavin excretion was very low, 60 to  $85\gamma$  per litre. The urine and blood-levels of oestrone were 4,000 M.U. in 24 hours, and 500 M.U. per litre respectively, normal values for the 7th month of pregnancy. In the oestrone clearance test a normal recovery of oestrone was found (4.5 per cent).

Case No. 10. A married woman, aged 34 years, attended the prenatal station in the 8th month of pregnancy. She complained of painful burning of the tongue which led to difficulty in eating. The patient, a very poor woman, had a history of 4 normal deliveries and I spontaneous abortion. She always menstruated normally at intervals of 31 days with 3 to 4 days loss. She was a tiny, undernourished woman with evident signs of nutritional deficiency such as stomatitis and cheilosis in a very severe form. This patient had suffered for 2 years from a burning sensation of the tongue, and from fatigue, with marked aggravation of these symptoms during the present pregnancy. Ocular examination revealed corneal vascularization. Riboflavin excretion in the urine was very low: 65 to 90y per litre urine, in 24 hour specimens. The urinary and blood serum levels of oestrogen were normal, 5,000 M.U. oestrone per litre urine, and r,000 M.U. oestrone per litre blood serum. The recovery of oestrone in the oestrone clearance test was 2 per cent.

Group C. Pregnant women suffering from infectious hepatitis and vitamin B deficiency.

'In 2 cases of pregnancy (cases 13 and 14) vitamin be deficiency was associated with severe liver damage due to infectious hepatitis, the deficiency syndrome having appeared during the course of the disease. The blood and urine oestrone levels were normal. Furthermore, additional oestrone administered was rapidly inactivated in the body, as shown by the oestrone clearance test.

Case No. 13. A multiparous woman, aged 28 years, in the 4th month of her 5th pregnancy, was admitted to the department for treatment of infectious hepatitis. Since the beginning of the present pregnancy the patient had vomited frequently. A severe deficiency condition had resulted, principally manifested by pronounced atrophic glossitis, macerated areas in the angle of the mouth and pellagroid changes of the skin of both legs with marked polyneuritic symptoms. During the previous week vomiting had become more severe, and was associated with pain in the hepatic region, fever of 2 days' duration and extreme muscular weakness. These symptoms were followed by the appearance of bile in the urine and by an icteric tinge of the sclerae. The jaundiced patient (icterus index: 200) was extremely undernourished and had all the clinical symptoms of The riboflavin vitamin B-complex deficiency. excretion in the daily urine was 75y per litre, and pyruvic acid excretion in the urine was high, 320 mg. in 24 hours. Liver function tests pointed to serious liver damage: Cephalin test +++, and Takata-Ara reaction +. The inability of the liver to esterify cholesterol was demonstrated by the relatively high ratio of free cholesterol (76 per cent) to cholesterol-ester (52 mg. per cent). The total cholesterol blood concentration was 128 mg. per cent. Blood urea as well as amino acids and glucose were normal.

On physical examination a slightly enlarged and tender liver and a soft and enlarged spleen were observed. These findings were associated with a poor general condition marked by a tachycardia of 120, apathy and extreme asthenia, indicating a severe form of infectious hepatitis. Notwithstanding the evident signs of vitamin B deficiency and of severe liver damage (Zondek and Black), no impairment of the mechanism of oestrone inactivation was found. The oestrone content of the urine was 500 M.U. per litre in 24 hours, a normal value for the 4th month of pregnancy. The recovery of 4 per cent oestrone in the urine after intramuscular injection of 125,000 M.U. was normal. The patient recovered after a severe hepatitis of 4 weeks' duration.

Case No. 14. A 4-para, aged 27 years, was admitted to the hospital for treatment of infectious hepatitis during the 7th month of pregnancy. Ten

days prior to admission the patient suffered from loss of appetite, nausea and asthenia which were later attributed to a preicteric stage of infectious hepatitis. At the time of admission the patient had severe jaundice with an icterus index of 220. She complained of pain in the right upper abdomen, and the liver was found to be distinctly enlarged. The nutritional history of the patient showed that her daily intake of the various fractions of the vitamin B-complex was considerably below the required minimum. The deficiency was later aggravated by vomiting, and was associated with glossitis, cheilosis, angular stomatitis and corneal

vascularization. The daily excretion of riboflavin in the urine was very low,  $65\gamma$ . Liver function tests revealed serious hepatic impairment (cephalin test ++, Takata-Ara ++, Van den Bergh +++, blood glucose, 67 mg. per cent). The general condition of this patient deteriorated and the urea blood level dropped to 6 mg per cent. Oestrogen titration of the blood and urine and the oestrone clearance test performed at this time failed to demonstrate impairment of oestrone metabolism.

Our results are summarized in Tables I to III.

Group A. Data obtained from regularly menstruating women with vitamin B deficiency

(	Group A. Data obtained from regu	ılarly menstruat	ing women wi	th vitamin B defic	ciency.
Case No.	Clinical history, symptoms, signs of vitamin B deficiency	Endometrial pattern	Vaginal smear	Oestrogen level in blood serum and urine	Oestrone clearance test
I.	Age 22 years, 26-30 days' menstual cycle, 4 days' normal flow, glossitis, cheilosis, corneal vascularization, diarrhoea, riboflavin, excretion in urine: 907 per litre	Progestational phase	Normal oestrogenic activity		
2.	Age 19 years, 28 days' menstrual cycle, 3–5 days' normal flow, glossitis, corneal vascularization, pellagroid skin changes, riboflavin excretion in urine: 70 to 90y per litre	Progestational phase	Normal oestrogenic activity		٠
3.	Age 31 years, vaginal discharge, 30 days' menstrual cycle, 3-4 days' flow, colpovaginitis, glossitis, cheilosis, fissuring of the lips, corneal vascularization, daily riboflavin excretion in urine: 80 to 100y per litre	Progestational phase	Normal oestrogenic activity	120 M.U./litre in urine 25 M.U./litre in blood	Recovery 0.5 per cent
4.	Age 34 years, 30 days' menstrual cycle, 3 days' normal flow, stomatitis, perlèche, vomiting, asthenia, riboflavin excretion in urine: 65 to 85γ per litre	Progestational phase	Normal oestrogenic activity		,
5•	Age 21 years, fatigue, diarrhoea, abdominal pain, 26 days' cycle, 3 days' normal flow, glossitis, angular stomatitis, seborrheic accumulations in the naso-labial folds, pellagroid skin changes, corneal vascularization, riboflavin excretion: 75 to 95γ per litre, pyruvic acid excretion in 24 hours' urine: 280 mg.	Progestational phase	Normal oestrogenic activity	200 M.U./litre in urine 33 M.U./litre in blood	
6.		Progestational phase	Normal oestrogenic activity		Recovery 0.5 per cent

TABLE II.

Group B. Data obtained from pregnant women with vitamin B deficiency.

Case No.	Clinical history, symptoms, signs of vitamin B deficiency	Endometrial pattern	Vaginal smear	Oestrogen level in blood serum and urine	Oestrone clearance test
7.	Age 35 years, 3-para, 5th month, vomiting, angular, stomatitis, glossitis, pellagroid skin changes, riboflavin excretion in urine: 85 to 95γ per litre	Progestational phase	Normal oestrogenic activity		
8.	Age 26 years, 2-para, 7th month, cheilosis, glossitis, stomatitis, polyneuritis, corneal vascularization, riboflavin excretion in urine: 60 to 85γ per litre	Progestational phase	Normal oestrogenic activity	4,000 M.U./litre in urine 500 M.U./litre in blood	Recovery ca. 4.5 per cent
9.	Age 24 years, 1-para, 8th mouth, vomiting, diarrhoea, asthenia, glossitis, chellosis, angular stomatitis, riboflavin excretion in urine: 60 to 857 per litre	Progestational phase	Normal oestrogenic activity		
10.	Age 34 years, 6-para, 8th mouth, stomatitis, cheilosis, corneal vascularization, riboflavin excretion in urine: 65 to 90% per litre	Progestational phase	Normal oestrogenic activity	5,000 M.U./litre in urine 1,000 M.U./litre in blood	Recovery ca. 2.0 per cent
11.	Age 29 years, 3-para, 6th month, glossitis, pellagroid skin changes, corneal vascularization, riboflavin excretion in urine: 60 to 100y per litre		Normal oestrogenic activity		
12.	Age 32 years, 2-para, 9th month, cheilosis, glossitis, pellagroid changes of skin, riboflavin excretion in urine: 95 to 1007 per litre	Progestational phase	Normal oestrogenic activity		

#### DISCUSSION.

Our observations on a series of women with manifestations of severe vitamin B complex deficiency fail to demonstrate any excess of oestrogenic hormone activity in these patients. If the presence of vitamin B in the body were necessary for the inactivation of oestrone by the liver in women, various symptoms of hyperoestrinism (e.g., abnormal genital bleeding, glandular hyperplasia, sterility and unusually elevated oestrogen levels in the blood and urine) might have been expected to occur in such cases. However, our patients with vitamin B deficiency did not differ from

normal women in these respects (Group A). Furthermore, oestrone clearance tests demonstrated that the livers of these patients were able to inactivate large doses of injected oestrone.

Since the livers of patients suffering from vitamin B deficiency readily inactivated the total amount of oestrogenic substance secreted during the normal genital cycle, further tests were made in order to ascertain whether such livers are also able to inactivate the increased amount of oestrogen present in normal pregnancy (Group B). In all the cases studied, oestrogen inactivation by the liver was found to be unimpaired, and even the large additional

TABLE III.

Group C. Data obtained from pregnant women suffering from vitamin B deficiency and infectious hepatitis.

Case No.	Clinical history, symptoms, signs of vitamin B deficiency	Endometrial pattern	Vaginal smear	Oestrogen level in blood serum and urine	Oestrone clearance test
13.	Age 28 years, 5-para, 4th month, infectious hepatitis, vomiting, atrophic glossitis, macerated areas in the angles of the mouth, pellagroid changes of skin, polyneuritis, riboflavin excretion: 757 per litre, icterus index: 200, cephalin test + + +, Takata-Ara, +, free cholesterol: 76 mg. per cent, cholesterol ester: 52 mg. per cent, pyruvic acid: 320 mg. in 24 hours.	Progestational phase	Normal oestrogenic activity	500 M.U./litre in urine	Recovery ca. 4.0 per cent
14.	Age 27 years, 4 para, 7th month, infectious hepatitis, nausea, asthenia, icterus index: 220, glossitis, cheilosis, angular stomatitis, corneal vascularization, riboflavin excretion in urine: 65γ per litre, cephalintest +++, Takata-Ara ++, Van den Bergh +++ (direct)	Progestational phase	Normal oestrogenic activity	1,000 M.U./litre in 24 hours' urine 250 M.U./litre in blood serum	Recovery ca. 1.0 per cent

amounts of oestrogen administered were easily inactivated.

The mechanism of oestrone inactivation was normal, not only in pregnant women with adequate hepatic function, but also in patients whose livers were seriously damaged by infectious hepatitis during pregnancy (Group C). It has been shown that in patients suffering from acute liver damage a vital hepatic function such as cholesterol esterification may be lost, although oestrogen inactivation remains normal. In such cases a severe vitamin B deficiency syndrome develops after the failure of normal liver function, yet no impairment in oestrone metabolism ensues. Only in extreme failure of the liver function (precoma or coma hepaticum) is any impairment observed in the ability of the · liver to inactivate oestrone (Zondek and Black, 1947).

Our clinical findings were corroborated by animal experiments (Zondek and Finkelstein, 1947). Rate maintained on vitamin B-free diets were able, even in a state of cachexia, to inactivate injected oestrogen in vivo. It follows that vitamin B is not an essential factor in the oestrogen inactivation mechanism.

#### SUMMARY.

- (I) Inactivation of endogenous and exogenous oestrogen remains unimpaired in vitamin B deficiency. This is proven by the following findings:
- (a) No clinical symptoms of hyperoestrinism (e.g., enlarged uterus, cystic mastitis, etc.) were observed.
  - (b) Vaginal smears were normal.
- (c) Biopsies of the endometrium taken before menstruation showed a normal progestative phase.
- (d) Oestrogen titres in the blood and urine were normal.

- (e) Oestrone, injected for an oestrone clearance test, was inactivated in a normal manner.
- (2) Pregnant women suffering from vitamin B deficiency showed no impairment of oestrogen inactivation and this holds true even when their liver function was otherwise damaged by concurrent infectious hepatitis.
- (3) Since no changes in oestrogen inactivation were observed in women suffering from severe vitamin B deficiency, the vitamin seems not to be an essential factor in the oestrogen inactivation mechanism.

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# EVOLUTION AND GROWTH OF TADPOLES BY FEEDING VERNIX CASEOSA, PROGESTERONE AND FOLLICULIN

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In recent communications (Lajos and Szontágh, 1942, 1947a, 1947b) we reported that vernix caseosa has a powerful oestrogenic effect. Simultaneously we found that even large doses of vernix have no gonadotrophic action (Lajos and Szontágh, 1947b, 1947c).

These results, combined with promising clinical observations (to be reported elsewhere) and some data of the literature (Erbslöh, 1942a, 1942b, 1943; Markow and Kissin, 1927; Kulka, 1932; György and Borbáth, 1943) suggested that the vernix caseosa plays an important physiological role in foetal development. The high folliculin content is certainly of great importance. The problem whether other factors have to be considered had to be investigated.

#### EXPERIMENTS.

Four groups, consisting each of 25 tadpoles, originating from the same batch of eggs, were kept in daily-changed tap water of 20–22°C. (68–72°F.). The tadpoles were fed with dried and pulverized hog's heart. To the food of Group I, 10 per cent vernix caseosa was added, Group II received 1000 I.U. folliculin per g. food, Group III 1 mg. progesterone per g. food, and Group IV served as control.

On the 11th day of the experiment (11th April, 1947) a slight difference in favour

of Group I, that receiving vernix, could be observed. On the 19th day this difference was quite evident (Fig. 1). The tadpoles fed with vernix markedly exceeded in in growth all others, those receiving progesterone coming second, while no difference was observed between the folliculin and control group.

At the end of the 3rd week a difference in the rate of evolution became apparent. Table I shows that in Group I (vernix) the buds of the distal extremity appeared 6 to 10 days, and those of the proximal extremities 12 to 15 days, earlier than in the other groups.

Fig. 2 shows the animal in the most advanced stage of metamorphosis from each group on the 37th day. In Group I (vernix) metamorphosis was nearly complete in some animals, while in the other 3 groups only the distal extremities were apparent.

Metamorphosis was completed earliest in the vernix group; the other groups followed with a minimum lag of 8 to 10 days. It is rather remarkable that in the vernixfed group an interval of only 4 days elapsed between the first and the last animal of the group completing metamorphosis; while in Group II (progesterone) 23, in Group III (folliculin) and Group IV (control) 44, days were necessary. It seems noteworthy that in 5 animals of Group III metamorphosis

TABLE I.

I	2	3	4	5
Group	Appearance of buds of distal extremity	Appearance of buds of proximal extremity	Day of experiment on which metamorphosis was com- pleted by first and last animal	of metamorphosis of the
I. II. III. IV.	20th day 26th ,, 30th ,, 30th ,,	30th day 42nd ,, 44th ,, 45th ,,	39th-43rd day 47th-70th ,, 49th-93rd ,, 49th-93rd ,,	4 days 23 ,, 44 ,, 44 ,,

The figures of columns 2 and 3 give the day of the experiment on which 50 per cent of the animals reached the specified state of metamorphosis.

remained incomplete and 2 of these died on the 121st and 3 on the 157th day.

Table II registers the weight of the animals. The greatest gain of weight was observed in the vernix-group. The relative gain was greatest at the end of the 4th week in the vernix-group, and at the end

in formalin after completing metamorphosis. The difference is less than during earlier stages of the experiment, but nevertheless marked.

The possibility that the fat content of vernix caseosa might be a factor in promoting growth had to be considered. Therefore

TABLE II.

Weeks		3		4	···-	5	. (	6
Group	Weight of 20 animals in g.	Per cent difference compared with control	Weight of 20 animals in g.	Per cent difference compared with control	Weight of 20 animals in g.	Per cent difference compared with control	Weight of 20 animals in g.	Per cent difference compared with control
I. II. III. IV.	8.0 6.5 5.8 5.8	37.9 12.0 0.0	11.0 7.7 6.8 6.7	64.1 14.9 1.5	14.7 12.2 9.9 9.2	59·7 · 32·6 7·6	13.4 12.9 12.6	6.3

of the 5th week in the progesterone-group. Later the difference between these groups and the others diminished in accordance with the onset of metamorphosis. Table III shows the weight of the animals fixed

TABLE III.

Group	Weight of 20 animals in g.	Per cent difference compared with control group
I. II. III. IV.	8.8 8.4 7.6 6.7	31.3 25.3 13.3

2 groups of 15 five-weeks-old tadpoles of the same batch were fed with 10 per cent vernix and 10 per cent suet respectively.

Table IV shows that no significant difference was observed between the 2 groups regarding the onset of metamorphosis, nor in the completion of metamorphosis of the first animals of both groups. Yet while in the vernix-group all animals completed metamorphosis within 28 days after the first of the group, in the suet-group 42 days elapsed. Even more pronounced were the differences of body-weight (Table V), the weight of the vernix-group being 35 per

TABLE IV.

I	2	3	4	5
Group	Appearance of buds of distal extremity	Appearance of buds of proximal extremity	metamorphosis was com-	Interval between completion of metamorphosis of the first and last animal of the group
Vernix Fat	44th day 46th ,,	48th day 51st ,,	50th-78th day 51st-93rd ,,	28 days 42 ,,

The figures of columns 2 and 3 give the day of the experiment on which 50 per cent of the animals reached the specified state of metamorphosis.

TABLE V.

Weeks	5 ' 6 7		After metamorphosis				
Group	Weight of 10 animals in g.	Weight of 10 animals in g.	Per cent difference compared with control	Weight · of 10 animals in g.	Per cent difference compared with control	Weight of 10 fixed animals in g.	Per cent difference with control group
Vernix Fat	2.2	3·7 2·9	<sup>27.5</sup>	4.6 · 3.4	35.2	4.0 3.2	25.0

cent above the suet-group on the 14th day of the experiment and 25 per cent above the suet-group after complete metamorphosis.

#### DISCUSSION.

Our results seem to show conclusively that while vernix caseosa promotes growth and metamorphosis, progesterone acts only on growth and folliculin has no obvious effect.

The fat-content of vernix as a possible cause could be excluded (McCarrison, 1921) and the same could be said of folliculin, although the data of earlier investigators in this respect are somewhat contradictory (Abderhalden, 1915; Laqueur, Borchardt, and de Jongh, 1927); Borchardt, 1930; Romeis, 1920).

It is known that thyroid feeding accelerates metamorphosis and inhibits growth and thymus promotes growth and inhibits metamorphosis (Gudernatsch, 1921; Abderhalden, 1915, 1919; Romeis, 1920, 1922, 1923, 1924). Results with the

pituitary were not uniform, in some cases growth was accelerated and metamorphosis inhibited, in others the reverse was observed (Abderhalden, 1919). Some growthpromoting action was observed following administration of epiphyseal extracts, and a more pronounced one from parathyroid extracts (Romeis, 1920). Some investigators observed acceleration of metamorphosis by the placenta (Abderhalden, 1919), while others found it inactive (Ganfini, 1930). De Nunno (1932) reported that pulverized decidua or an extract of decidua promotes both growth and metamorphosis. The active principle was contained in the alcohol-soluble lipoid fraction.

Otherwise results resembling ours, in so far that acceleration of both growth and metamorphosis were obtained, were observed only when combinations of endocrine glands were tested. The promotion of growth and metamorphosis as observed in our experiments with vernix resemble the

combined effect of thymus and thyroid feeding (Abderhalden, 1915), but until further data are collected any statement about the mechanism of the action of vernix would be necessarily highly speculative and therefore premature.

#### SUMMARY.

Addition of 10 per cent vernix to the food of tadpoles is followed by a marked acceleration of growth and metamorphosis. Progesterone promotes growth, but has no effect of metamorphosis. Folliculin or fat feeding has no definite effect on either.

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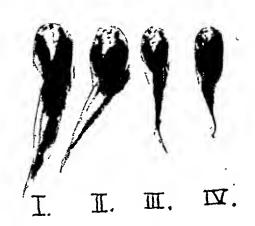


Fig. 1.

The biggest animal in each group on the 19th day.

I. Vernix. II. Progesterone III. Folliculin. IV. Control.

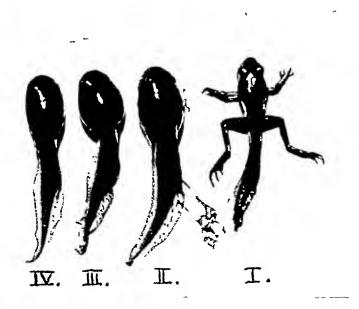


Fig. II.

Animals in most advanced stage of metamorphosis on 37th day.

I. Vernix. II. Progesterone. III. Folliculin. IV. Control.

L.L. & F.Z.

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# DEMONSTRATION BY INFRA-RED PHOTOGRAPHY OF THE SUPERFICIAL VEINS IN THE PREGNANT AND NON-PREGNANT WOMAN

BY

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INFRA-RED rays demonstrate structures not well visible to the naked eye or to a photographic film sensitive only to a normal range of wavelength. Penetration by these rays occurs to a depth of  $\frac{1}{2}$  to 2 mm. below the surface of the skin; they are well adapted, therefore, for the display of superficial subcutaneous veins. Plates I and II show the contrast between photographs of the breast taken with ordinary orthochromatic film and film sensitive to infra-red rays. The facilities and scope of the use of these rays in clinical photography have been recognized and papers have appeared on the subject. Massopust (1936) and Gorman and Hirsheimer (1939) considered their application to the changes taking place in the superficial venous system of the pregnant woman, and showed, photographically, the enlargement and extent of these veins, so well recognized clinically. Their conclusions seemed worthy of reexamination and amplification, and in view of the medical photographic service available in the London County Council Hospitals it was decided to carry out an investigation as there does not seem to have been much done on this subject in Britain. Whilst, in the main, our results support the observations of previous observers, certain others have been made, particularly in regard to the details and the extent of the changes in the breast veins during pregnancy.

Material.

Patients (115) drawn from the Antenatal Clinics at St. Thomas's Hospital and Lambeth Hospital were photographed to demonstrate the changes in the superficial venous system during pregnancy and the puerperium. Forty were primigravidae and 42 were multigravidae. Cases of various types of abortion were also included.

The areas chosen for photography were the breast as being the area most capable of showing variation; the abdomen in some cases; the legs; and in a few patients, the vulval area. Thirty-three non-pregnant patients were also photographed as controls and to repeat observations (Gorman and Hirsheimer, 1939) on the lack of changes in the menstrual cycle; also to demonstrate the effect of local lesions in the breast.

Lastly, encouraged by the differences apparent in the superficial venous system of the breast in the non-pregnant and pregnant patients, a series of 70 has been studied to see if these changes have any bearing on the differential diagnosis of pregnancy from the causes of secondary amenorrhoea, etc.

# Photographic Details.

Camera. Half-plate studio type with Thornton Pickard roller-blind shutter and mahogany slide boxes to hold the plates.

Lens. 8½-inch F/4.5 Dallmeyer Serrac. With this lens focusing can be carried out in a routine manner, as the foci of the I.R. rays and ordinary light are the same. The lens is then covered by the filter which is almost opaque.

Lighting. Two "photoflood" lights in reflectors, one on each side of the camera and 12 inches away from the lens and a little below the optical axis to avoid shadows under the breasts. The patients' eyes are shielded from the strong light.

Distance. Four feet from the subject.

Exposure. Two seconds at F/8. The patient is requested to hold her breath during the exposure.

Plates. Kodak I.R. type III R.  $6\frac{1}{2}$  inches by  $4\frac{3}{4}$  inches. These are not stocked by the manufacturer, but can be made to order.

Developer. M.Q. (Kodak D 19 b. 1). Four to 5 minutes at 70°F.

Position of patient. Sitting.

The negative may prove to be more or less dense according to whether the patient is blonde or brunette. This is unimportant.

Consideration of Changes of the Veins in Areas Studied.

The superficial veins studied in the breast, abdomen, legs and vulva show changes, to varying degrees, during the pregnancy. These changes are earliest to appear and are most marked in the breast. In non-pregnant women no changes are demonstrable during the phases of the menstrual cycle, even in patients complaining of pre-menstrual fullness. Variations found in non-pregnant women depend mainly on pendulosity of the breast; in which case the lateral radicles of the internal mammary veins and the intercostals tend to be more marked. After the menopause the veins become less marked. Local changes may also be found if a tumour is present in the breast.

The Veins of the Breast during Pregnancy and Lactation.

The findings of Gorman and Hirsheimer (1939) that observable changes occur in the breast veins as early as 3 to 4 weeks of pregnancy were confirmed. These changes are usually marked by 8 weeks or so (Plates III and IV). In typical cases the veins increase in number, the main radicles become thicker and photograph with a increased density, anastomoses develop between the veins, particularly as they approach the nipple, and in many cases the circumareolar plexus becomes very marked indeed. Gravidity (primigravid or multigravid) appears to have no effect on these changes, but the extent to which they occur is variable and not constant in time of appearance. Thus, a single photograph may not show them, but another, taken a few weeks later, may do so. In general, it was the impression that patients who were threatening to abort showed less marked changes than those with a normal pregnancy (Plates V, VA, and VB). The veins became more marked

still towards term and this is also the case in the puerperium (Plates VI and VII). Following cessation of lactation, some weeks or months elapse before a return to normal occurs. The same is true following abortion. In general, there is a striking contrast between the I.R. photograph of the breast in the pregnant and non-pregnant. Notably, in the latter the collateral anastomoses are absent or not opened up, but the appearance can partially be simulated in the non-pregnant breast if pendulous. In pregnant patients the collaterals to the arms are usually more marked than in the nonpregnant. These vessels may also be enlarged from other causes, e.g., thoracic tumours. In view of discussion as to the cause of the change in appearance of the breast veins in pregnancy, photographs were also taken of local breast lesions (Plate VIII). These that a lesion in the one breast may produce local enlargement of the veins in that breast. Furthermore, a patient who was pregnant subsequent to an amputation of the breast for cancer previously showed changes characteristic of pregnancy in the remaining breast and also enlargement of the veins on the amputated side.

# Veins of the Leg.

Contrary to the clinical impression that veins of the leg become larger early in pregnancy no change was demonstrated under about 4 to 5 months when the saphenous system can be shown. The change, once it has appeared, does not seem to be altered by the duration of the pregnancy.

# Veins of the Abdominal Wall.

As in the leg, the changes are not marked and appear from the fifth month onwards. The superficial epigastric and thoracic anastomoses can be shown.

# Vulva and Vagina.

These areas are not well suited to demonstration. The vulva must be shaved, as the rays do not penetrate hair. The darker pigmentation of the skin, and the more diffuse veins do not give a good picture.

# Causation of the Changes.

Various theories have been put forward in explanation of the changes. These may be summarized as: (1) dilatation and apparent increased vascularity are due to metabolic demands of the breast tissue; (2) the changes may be due to hormonal influences; (3) there may be physical alteration in the calibre of the veins and their depth from the surface of the skin which makes them appear more prominent in the photographs. It is also possible that the same cause is not responsible for the changes in all the observed areas. The later appearance of the veins in the legs and on the abdomen would seem to be against a generalized factor such as an endocrine stimulus. It would appear to be very reasonable to suggest that in the leg the main cause is increased pressure as the veins appear when the uterus is well developed in size. Similarly, in the case of the abdomen, the third explanation as put forward by Gorman and Hirsheimer would seem to be applicable, i.e., that the uterus increasing in size pushes forwards the abdominal wall and makes the veins come nearer to the surface and hence more easily photographed.

The earliness of the changes seen in the breast would seem to us to be in favour of the local demands of the developing tissue. This in turn may be caused by the endocrine stimulus to the breast tissue in early pregnancy or by direct action on the unstripped muscle of the veins themselves. The fact that definite changes of increased vascularity are noted in other breast lesions is in favour of this, as is also the demonstration

of enlarged radicles in the amputation scar of another patient (Plate VIII). The variable extent of the changes in pregnancies and in abortional cases may be further evidence.

The Breast Veins as a Physical Sign of Pregnancy and an Aid to Diagnosis.

Encouraged by the very definite contrast favourable under circumstances seen between the photographs of the veins of the breast in the pregnant and non-pregnant patients, a series of photographs was taken of patients attending the antenatal and gynaecological clinics to see if sufficient accuracy could be attained to establish a diagnosis or not of pregnancy. Cases sent up for "booking", patients "booked" (these are referred to in the above table as "routine" or "R", and cases with secondary amenorrhoea of doubtful diagnosis referred by our colleagues were included (these latter are labelled "Puzzled" or "P" in the table). diagnosis for the I.R. material was made before the clinical history was given. these cases, the one breast only was photographed so as to exclude confusion from the upper thoracic veins which are frequently marked in patients with pendulosity of the breasts and to demonstrate in detail the developing collaterals. We have listed the main details and results of this series in the table.

If the changes fully typical of pregnancy were present, viz., increase in density and lumen of veins, development of the mosaic patterns of collateral circulation, and/or the enlargement of the circumareolar veins, a full "positive" diagnosis was given. Not infrequently, particularly in abortional patients, changes suggestive of pregnancy, but not fully definite, were found. The mosaics are less dense and appear "broken These are listed as "probable positive " or "doubtful" as an attempted

forecast.' Some were re-photographed later and showed more positive changes. Our series is too small for any real accuracy of statistics and therefore we make no attempt at detailed analysis. "positive" (full and probable) 53 were correct, I incorrect. Of the full positive 35 were correct, none incorrect. Of the "probables " 17 were correct and I incorrect.

If none of the changes were present a "negative" diagnosis was made. Of 17 "negative" results, 12 were correct and 5 incorrect.

As compared with the "positive" results these last were disappointing in their inaccuracy.

The results in abortional cases are interesting, but no great help is obtained clinically as the changes take longer to disappear than the time taken for an Aschheim-Zondek or Friedman test to The results are misbecome negative. leading, therefore, as to the continuation or not of a pregnancy in threatened abortion.

A test for pregnancy should be at least 95 per cent accurate. It should be rapid, simple to carry out and preferably cheap. The I.R. photographs do not appear to give a high enough degree of accuracy, certainly so far in the "negative" results, but have the merits of being cheap and rapid to carry out and are a help easily obtained in a hospital with a good photographic unit. The method must be regarded as one of demonstrating a physical sign of pregnancy which is subject to the vicissitudes of such physical signs.

It is possible that other aids to the photography may increase the degree of accuracy. We have found that the use of the negative plate is better than the print " positive " made from it. Also in a doubtful case repetition of the photograph a week or two later may show developing changes. This may help to improve the results in the

"negative" series.

# PREGNANCY DIAGNOSIS SERIES.

		Prev obst					
		hist		I.R.	04 1 1 5 1	Routine or	7714
No.	Age	С	M	Diagnosis	Clinical findings	puzzle	Result
I.	28	0	0	Negative	6 weeks' amenorrhoea Thought herself pregnant Aschheim-Zondek negative	Ъ.	Correct
2.	21	o	o	Positive	Period came on later 7 weeks' amenorrhoea	P	Correct
3.	35	o	o	Negative	Clinically pregnant 6 weeks' amenorrhoea Thought herself pregnant	P	Correct
4.	30	o	2	<ul><li>r. Probable positive</li><li>2. Positive</li></ul>	Clinically not pregnant 3 months amenorrhoea Clinically pregnant	R	Correct
5.	22	o	o	(repeat) Positive	3 months' amenorrhoea Clinically pregnant	R	Correct
6 & 10.	22	o	o	<ol> <li>Positive (probable)</li> <li>Positive</li> </ol>	2 months' amenorrhoea Sterility case Clinically pregnant	P	Correct
7.	32	O	0	Positive	3 months' amenorrhoea Intact hymen. Pregnant	P	Correct
8, 21 & 34.	27	o	0	Positive	5 months' amenorrhoea Thought not pregnant Later AZ. positive. Had sn	P nall	Correct
9 & 45·	33	3	0	Positive	4 months' amenorrhoea Clinically pregnant	R	Correct
10.	See 6	, above		35		70	<u> </u>
ii.	27	2	0	Negative	2 months' amenorrhoea then had loss and loss again a month later Clinically pregnant	P	Incorrec
12.	25	0	0	Positive (probable)	2 months' amenorrhoea Clinically pregnant Had '' losses''	P	Correct
13.	23	0	o	Positive	3 months' amenorrhoea Clinically pregnant	R	Correct
14.	33	o	0	Negative	10 weeks' amenorrhoea Clinically pregnant	P	Incorrec
15.	29	4	o	Negative	4 months' amenorrhoea Clinically pregnant but patient would not believe i	P t	Incorrec
16.	24	2	0	Positive (probable)	2 months' amenorrhoea Clinically pregnant	R	Correct
17.	17	0	0	Negative	4 months' amenorrhoea Clinically pregnant Later had early and marked pre-eclamptic toxaemia	R	Incorrec
18.	21	0	0	Positive	5 months' amenorrhoea Clinically pregnant	R	Correct
19.	36	I	0	Positive	3 months' amenorrhoea Vaginal bleeding Attempted criminal abortio	P	Correct
20.	34	٥ ,	o	Positive (probable)	3 months' amenorrhoea Threatened abortion	P	Correct

		Previous obste	tric	T 73			
No.	Age	histo C	M	I.R. Diagnosis	Clinical findings	Routine or puzzle	Result
21.	Sec 8,	above				······································	
22.	22	O	0	Positive	10 weeks' amenorrhoea	R	Correct
23.	21	o	o	(probable) Negative	Clinically pregnant to weeks' amenorrhoea	P	Correct
24.	21	o	O	Positive	Clinically not pregnant 30 weeks' amenorrhoea Clinically—state of preg-	P	Correct
25.	24	o	O	Positive (probable)	nancy had been queried 3 months' amenorrhoea Clinically pregnant (2 irregular losses)	P	Correct
26.	21	0	O	Negative	5 months' amenorrhoea Clinically not pregnant	$\mathbf{R}$	Correct
27.	24	I	I	Positive (probable)	6 weeks' amenorrhoea Then 2 losses. Thought		Correct Tubal mol
28.	45	0	o	Positive	clinically not pregnant 4 months' amenorrhoea	P	Incorrect
29 & 44	25	O	I	(doubtful) Positive (probable)	Clinically not pregnant 4 months' amenorrhoea Threatened abortion	P	Correct
30.	24	3	0	Positive (probable)	Clinically pregnant Threatened abortion 2 months' amenorrhoea Clinically pregnant	P	Correct
31.	32	I	O	Positive	Clinically pregnant 3 months' amenorrhoea Clinically pregnant Asshbir Zondak positive	R	Correct
32.	22	О	0	Negative	Aschheim-Zondek, positive Clinically not pregnant	${\tt R}$	Correct
33.	29	0	0	Positive	3 months' amenorrhoea Clinically pregnant	R	Correct
34.	See 8	above			Chincary pregnant		
35.	26	O	O	Positive	2 months' amenorrhoea	R	Correct
36.	33	ı	O	Positive	Clinically pregnant ro weeks' amenorrhoea	R	Correct
37•	32	O	o	Positive (probable, of abortional type)	Clinically pregnant ro weeks' amenorrhoea ? Incomplete abortion Aschheim-Zondek, negative	Р (	Correct abortional
38.	21	ı	0	Positive	3 months' amenorrhoea Clinically pregnant	R	Correct
39 & <b>7</b> 9.	23	I	O	<ol> <li>Positive (probable)</li> <li>Positive</li> </ol>	6 weeks' amenorrhoea Thought not pregnant clinically, at first Clinically, pregnancy con-	P	Correct
<b>4</b> I.	39	I	ı	Positive	firmed later 2 months' amenorrhoea	R	Correct
42.	33	ı	I	Negative	Clinically pregnant 2 months' amenorrhoea	R	Incorrect
43. 44.		o 9, above.	o	Negative	Clinically pregnant Clinically <i>not</i> pregnant	P	Correct
45. 46.	See 9, 24	above.	0	Positive	Incomplete abortion Tissue in uterus at time of photograph	P	Correct

		Prev obste hist	etric	I.R.		Routine or	
No.	Age	C	M	Diagnosis	Clinical findings	puzzle	Result
7.	31	0	0	Positive	2 months' amenorrhoea Clinically pregnant	R	Correct
<b>μ8.</b>	39	2	0	Negative	Clinically not pregnant "overdue" and short period	Р	Correct
<b>49</b> •	23	o	o	Positive (probable)	3 months' amenorrhoea Clinically pregnant	R	Correct
50.	42	7	O	Positive (probable)	2 months' amenorrhoea Patient was on admission list for menorrhagia Aborted later	Р	Correct
51.	44	I	0	Positive	One month's amenorrhoea Clinically pregnant later	P	Correct
52.	17	0	0	Negative	Clinically not pregnant	$\mathbf{R}$	Correct
53 & 54.	. 17	0	O	Positive	Clinically pregnant Near term!	R	Correct
55.	26	0	0	Positive	Clinically pregnant	R	Correct
56.	23	O	0	Negative	ro weeks' amenorrhoea Clinically not pregnant Period started later	Р	Correct
57•	40	2	2	Positive? (probable, of abortional type)	Abortion later	Р	Correc
бо.	27	0	0	Positive	2 months' amenorrhoea Clinically pregnant Aborted later	R	Correc
бт.	25	I	o	Positive	2 months' amenorrhoea Clinically pregnant	R	Correc
б2.	31	o	0	Positive	2 months' amenorrhoea Clinically pregnant	P	Correc
63.	25	2	o	Positive (probable, of abortional type)	? Threatened abortion . 6 weeks' amenorrhoea Then loss for 3 weeks	P	Correc
64.	26	ı	o	Positive	3 months' amenorrhoea Clinically pregnant	R	Correc
67.	25	O	O	Positive	6 weeks' amenorrhoea Clinically pregnant	R	Correc
68.	36	2	0	Positive	Had "loss". 2 months' amenorrhoea. Clinically pregnant	P	Correc
70.	31	3	О	Negative	Clinically not pregnant	P	Correc
72.	26	О	0	Positive	4 months' amenorrhoea Clinically pregnant	'R	Correc
73.	29	I	0	Positive	4 months' amenorrhoea Clinically pregnant	R	Correc
74.	33	0	0	Positive	4 months' amenorrhoea Clinically pregnant	R	Correc
75-	39	3	O	? Negative but film to be repeated. Shows minor changes.	Clinically pregnant	Р	
<b>7</b> 6.	28	2	0	Negative	10 weeks' amenorrhoea Clinically <i>not</i> pregnant	P	Correc

No.	Age	obst	vious etric tory M	I.R. Diagnosis	Clinical findings	Routine or puzzle	Result
77.	24	0	2	Negative for repeat	Irregular periods		
78.	28	o	0	Positive	3 months' amenorrhoea Clinically pregnant	R	Correct
79.	Sec 39	9, above	e		, 1		
8 <b>o.</b>	29	1	0	Positive (probable)	14 weeks' amenorrhoea Clinically pregnant	R	Correct
81.	29	4	0	Positive	4 months' amenorrhoea Clinically pregnant	R	Correct
82.	25	3	0	Positive	4 months' amenorrhoea Clinically pregnant	R	Correct
83.	35	4	0	Negative	3 months' amenorrhoea Thinks herself to be pregnant. Not so clinically	P	Correct
84.	20	0	0	Poor negative (for repeat)	,		•
85.	45	3	0	Positive	3 months' amenorrhoea Pregnancy queried Clinically pregnant	P	Correct
86.	27	1	o	Positive	4 months' amenorrhoea Clinically pregnant	R	Correct
87.	26	1	0	Positive	Baby born May 1947. One loss in October. Clinically 14 weeks' pregnant by uterine size	R	Correct

C = Infant delivered.

M=Miscarriage.

Numbers 40, 58, 59, 65, 66, 69 are missing from the above Table as they were patients photographed for puerperal changes in veins of the leg.

Number 71 was a fogged negative.

Numbers 75, 77, 84 are not completed as the negatives needed re-taking.

We have great pleasure in thanking Sir Allen Daley for the encouragement to use the L.C.C. Medical Photographic Service; Dr. J. E. McCartney, Pathological Service, L.C.C.; Dr. Watkins, Medical Superintendent, Lambeth Hospital; our colleagues (medical and nurses) at St. Thomas's and Lambeth Hospitals for referring patients;

and Drs. Dougall, G. Harrison and P. Bush for correlating some of the material.

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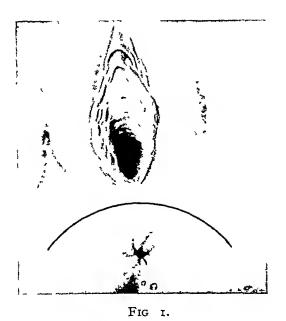
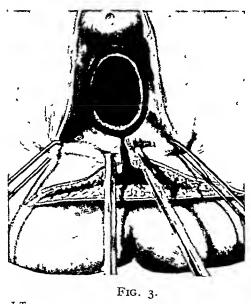


Fig. 2.



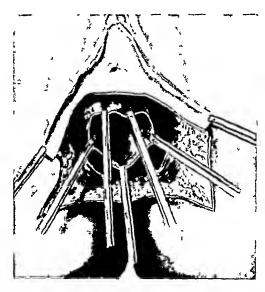


Fig. 4.

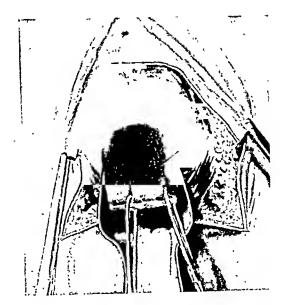


Fig. 5.

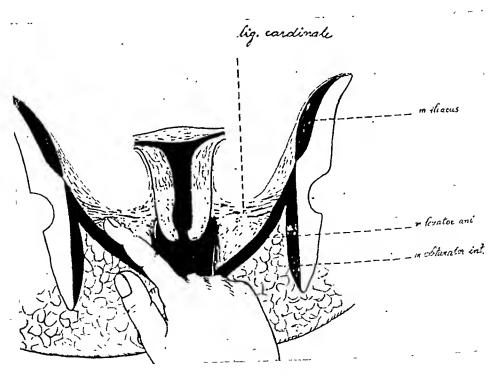


Fig. 6.

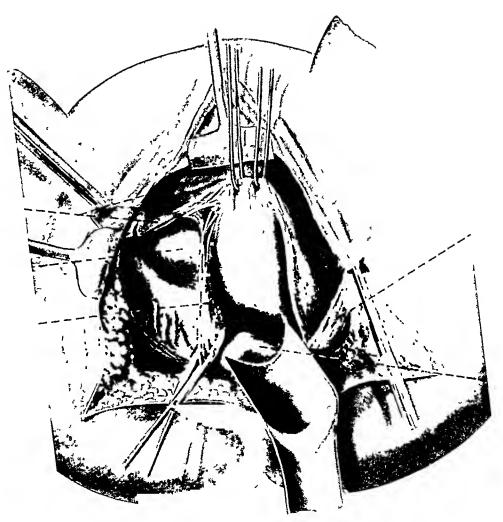


Fig. 7.

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	- 0		
			. 3.

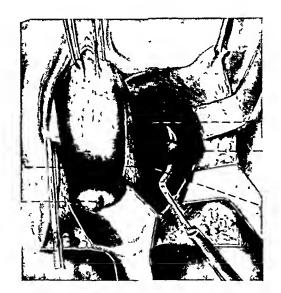
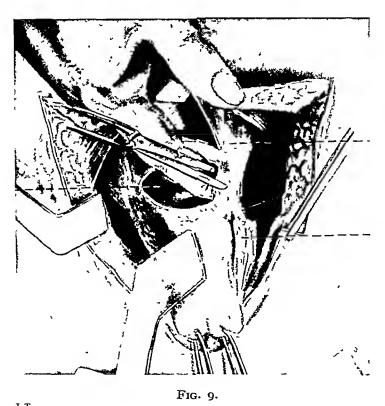


Fig. 8



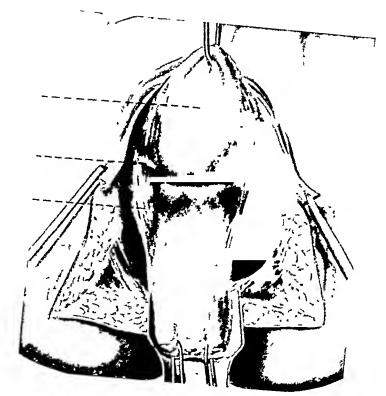


Fig. 10.

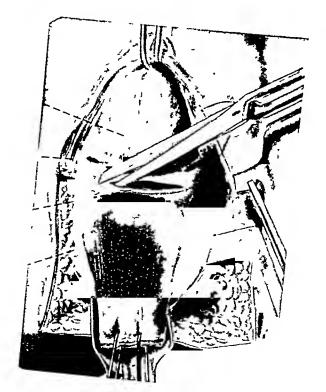


Fig. 11.

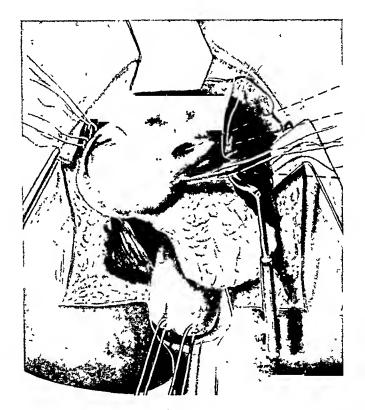


FIG. 12.

J.1.



# WILLIAM HARVEY—"THE FATHER OF BRITISH MIDWIFERY"\*

BY

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THE exigencies of the times we have been living through have caused a break of nine years in the sequence of our gatherings—the longest gap in the Society's history for over a century. There has been ample time for me to ponder the address which it is my privilege and duty to offer you, but I have never wavered in the determination, which I made on my appointment as your President in 1939, to try to recall the memory of William Harvey as a man who made a notable contribution to the progress and the character of midwifery in Britain.

In 1921 the late Professor Herbert Spencer chose this as the subject of his Harveian Oration to the Royal College of Physicians of London, and brought to bear upon it his wide knowledge of early medical history. But none of our own presidents, who were identified with obstetrics in their professional life, has done a similar service to our Society-perhaps because of the comparative meagreness of the material for the study of this aspect of Harvey's life and work. In these days of austerity an address founded on meagre materials may perhaps be accepted as a not wholly unsuitable precursor to a dinner similarly characterized! †

At any rate I feel it a duty to make the

All human values are relative. attempting to assess a man's achievement, we must take account of the circumstances that lay behind and around it. Admittedly the most epoch-making discoveries in history stand out in their grandeur almost unaffected by such consideration. Harvey's discovery of the circulation of the blood is one of these. Its splendour, as the outcome of one man's powers of accurate observation and clear logical reasoning, as well as its completeness and its profound inherent significance, are so transcendent that a study of the circumstances in which it was made adds comparatively little to it. But it is otherwise with Harvey's contribution to obstetrics, and so I offer no apology for asking you to consider the background of it all in the first place.

Harvey was born in 1578, and it was in 1602 that he returned from Padua, received his doctorate at Cambridge, and settled in London as a physician. In 1657 he died.

attempt, although I shall come far short of the hopes that led Thomas Aveling to say in the London Harveian Society in 1875—"Perhaps some future orator will be bold enough to display Harvey in his practical medical life as an able obstetrician, and an original and successful gynaecian, selecting for his theme that of Parturition." It was the same Dr. Aveling who first designated Harvey as "the Father of British Midwifery", and it is to Harvey's memory as such that I wish to pay tribute.

<sup>\*</sup> Being the "Oration" delivered to the Edinburgh Harveian Society, 21st May, 1948.

<sup>†</sup> The oration is customarily delivered immediately before the annual Dinner of the Society.

As a professional man his background in time is, therefore, the first half of the 17th century, and in place the England of the Stuart Kings.

We all remember our history sufficiently to know that it was a period of great social, political and religious unrest and change, but let me try to orientate our minds more accurately by recalling some of the main features of those days.

Harvey's England was the England of Evelyn's Diary, and his London very much the London of Samuel Pepys, who began his immortal diary some two and a half years after Harvey's death. It was a period when such science as the Greeks had bequeathed to the world was still choked by the weeds of superstition and belief in magic which had grown and flourished almost unchecked throughout the long centuries of the Middle Ages. But it was also the time when modern science may be said to have been born, largely under the influence of Harvey's older contemporary, Francis Bacon, who, it will be recalled, abandoned the deductive method of Aristotle and the schoolmen, under which observed facts were subject to interpretation according to preconceived theories, and advocated the method of inductive reasoning by which theories were based on the accumulation of isolated facts obtained by observation and experiment.

In literature it was the period of two of the most formative influences on our mother tongue. For Harvey's early professional years were the time when, as Saintsbury puts it, Shakespeare wrote "almost the whole of his finest work, of the work which most makes Shakespeare Shakespeare"; and it was the age which first welcomed the Authorized Version of the Bible.

The land of Harvey's England was largely open country—much of it wild moor or down- or marsh-land—broken up by great tracts of forest, the remnants of that

original old English forest "that the hand of men had never planted." The rest was open cultivated land over which "the new economy of enclosure was pushing out its green regularity of hedgerow and planted tree." The garden of England was in the making. The old Roman roads had fallen into decay, and such roads as there were had no solid foundation. Travellers on foot or horseback or in the few lumbering carriages of the day were liable to find themselves smothered in dust or wallowing in almost bottomless mud. All forms of transport and communication were slow and bad even between towns and cities, which were very small by our standards. The whole population of England was only some four to five millions, of whom about four-fifths were on the land. The population of Scotland was about half a million. The great middle-class was emerging as merchants and yeomen. The women of the manor-houses had their days occupied with multifarous domestic duties and with spinning, sewing and gardening: for it was at this time that flower-gardens first began to be cultivated. A little lower in the social scale they engaged also in home-industries, such as weaving, and in the labouring classes they shared in the lighter forms of agricultural work. There is no evidence that they took any great interest or part in outdoor exercises or sports, and their education was for the most part elementary.

Sanitary habits were unrestrained and unclean in all classes. There was little understanding and less practice of even the simplest rules of hygiene. They washed little and seldom. Drinking water was often impure and its dangers unknown or disregarded. They slept huddled together in unventilated rooms or closets. Disease was rife. "Plague", whatever its clinical entity may have been, was almost endemic in London and the larger towns, and in Harvey's time it flared up into disastrous

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pandemics on at least two occasions. Smallpox, not always clearly differentiated from measles, was a commonplace occurrence. An appalling infant mortality effectually prevented any great increase in the population. Doctors were few, and medicine was still too often dominated by superstition and folklore, although its emergence as a science was imminent under the stimulus of Harvey's discovery and the work of Sydenham, both of whom discarded the shackles of authority and taught that Truth was to be found only by observation and experimentation.

In the realm of obstetrics there was no science at all and very little art. Midwifery was still labouring under the heavy handicap of being regarded as an inferior branch of medical practice, unfit for the attention of physicians or even of surgeons. It was, and had been from time immemorial, the exclusive province of midwives, who were for the most part untutored. Medical help was sought only when the patient was in dire straits, and such help as could be afforded by a doctor, who was himself almost wholly without experience of normal childbirth, was largely limited to destructive operations on the child.

The professional midwives at this time were licensed by the bishops. A reputation for leading a godly, righteous and sober life seems to have been the main qualification for obtaining a license and, as that did not necessarily imply any knowledge of anatomy or midwifery, it is not to be wondered at that thoughtful people protested from time to time. Thus Andrew Boorde in his famous Brevyary of Health in 1542, after more or less tacitly accepting the importance of a good moral character, goes on to say "the Byshoppe, with the counsel of a doctor of Physick, ought to examine her and instruct her in that thynge that she is ignorant (of) . . . for and this were used in Englande, there shoulde not halfe so many women myscary, nor so many chyldren perish . . . as there be. The Byshop ought to loke on this matter."

Nearly a hundred years later, members of that intellectually restless family, the Chamberlens, to whom we owe the priceless gift of the obstetric forceps, showed praiseworthy public spirit in an endeavour to incorporate the midwives into a society which would control their training and licensing. Harvey must have been a fairly senior Fellow of the Royal College of Physicians of London when the project came before that body, but history does not relate what his attitude to it was, and it foundered on the shoals of professional jealousies. Several subsequent efforts along similar lines, including that of the Royal College of Surgeons of Edinburgh in 1726, also proved fruitless for one reason or another. It was not until the early part of the nineteenth century that effective action began and yet another hundred years were to elapse before the training and licensing of midwives came under statutory control.

In Harvey's time, therefore, the midwives were either quite untaught, and took to their profession largely as a means of earning a livelihood, or at the best served a sort of apprenticeship to older midwives, who doubtless taught them a modicum of knowledge derived from practical experience, and probably a deal of superstitious nonsense that the pupils would have been better without. Their great faults appear to have been their lack of patience and their consequent fondness for unnecessary interference, some of it of a brutal character, which imperilled the lives of mothers and infants and encouraged the incidence of puerperal sepsis.

When we pass to the consideration of the medical man's position in midwifery at this period, we have to remember that two centuries were still to pass before obstetrics

became a recognized part of the medical student's training. What knowledge of midwifery those early physicians and surgeons did possess was, therefore, acquired voluntarily by their study of the very scanty literature of the subject, most of it in languages other than their own, or involuntarily by the small and unhappy experience forced upon them when they were summoned by midwives to desperate cases.

In Harvey's early professional days the only printed book on midwifery in English was a translation from the German of Rhodion's De Partu Hominum, published in 1540 under the title of The Byrth of Mankynde. Harvey himself, of course, was clearly well-versed in the Latin works, mainly anatomical, of his Paduan teachers, and of such writers as Ambroise Paré, but for the less erudite The Byrth of Mankynde was the main source of instruction. Despite its many gross errors this was a remarkable book, and it must have fulfilled a purpose of some usefulness in its early days. It actually survived in a series of almost unchanged editions for 130 years-from the time of Henry VIII to the Restorationbut that notable achievement was less a tribute to its own intrinsic educative value than a testimony to the almost complete absence of any enlightened interest in obstetrics on the part of English medical In the preface to the first edition there is a reference to the prejudice that existed against the publication of obstetrical teaching in the vernacular owing to false modesty and the fear of encouraging prurient curiosity. "Many think that it is not meete ne fitting such matters to be intreated of so plainly in our mother and vulgar language . . . to the dishonour, as, they say, of womanhood and the derision of their own secrets . . . every boy and knave reading them as openly as the tales of Robin Hood."

One other obstetrical book appeared in English in 1612—a translation of *The Happy Delivery of Women*, by Guillimeau, who was one of the more distinguished pupils of Ambroise Paré, himself famous in obstetrics for his revival of podalic version.

While these two books give us an idea of what was then the accepted and available teaching of obstetrics in the early seventeenth century, a better idea of what the practice was like in England may be derived from a manuscript called Observations in Midwifery—as also the Countrey Midwife's Opusculum or Vade Mecum, Gentleman. Percival Willughby, Willughby was about twenty years junior to Harvey, and from his references to books published after Harvey's death, we may assume that his own work was compiled in his later years. It was, however, not published in print until 1863. Willughby passed the most of his professional life in Derby, except for five years in London, and he was evidently a much sought-after consultant in midwifery. Harvey personally and clearly had a great affection for him as a man and a profound admiration for him as an obstetric physician. He tells of how in 1642 "there came into my house at Darby my honoured good friend, Dr. Harvey", and of how shop "—mostly '' talked "several infirmities of the womb".

Incidentally, one wonders what Harvey was doing at Derby, for it was in the January of that year that Charles I had fled from London to York after his ill-starred attempt to impeach the five members of the House of Commons. Harvey is said to have accompanied him, being entrusted with the care of the King's health not only by Charles's own wish but also at the request of the Parliament. The Civil War opened in August at Edgehill where, as every Harveian knows, Harvey was

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present. Perhaps his royal master was on his way south to raise his standard at Nottingham, when Harvey dropped in

upon Willughby.

Willughby specifically states that he knows "none but Dr. Harvey's directions", so that we may safely assume that his own teaching was at least closely parallel to Harvey's; and if I quote freely from him, it is because his writings deal much more fully with the practical side of midwifery than does such of Harvey's own work as has come down to us.

Early in his Observations Willughby describes the foetal membranes and "the waters in which the infant swimmeth and with which the foetus is nourished . . . Most of the humour is commonly spent near the approaching time of delivery, and then it is probable that the foetus desireth to get forth, by reason that his provisions fail him . . . Then through the infant's enforcing and the paines of the mother the womb openeth." As we shall see, all these views were shared by Harvey. Willughby then says "after the child is born the midwife must fetch away the secondine "apparently implying that the prompt manual removal of the placenta was the accepted practice, for he later says, in a tone of something like surprise, that "there bee some midwives that never offer to fetch the after-birth, but suffer Nature to expel it, and their women have done well." But he goes on to state that he was moved to describe the placenta and membranes "for that there be some simple midwives that imagine that the child oft sticketh to the woman's back; and they do not blush to affirme their ignorances, how they have separated the child from sticking to the back." As a sidelight on the practice of midwifery such unnecessary interference explains much.

The process known in modern obstetrical jargon as "ironing out the perineum" was

apparently used by the midwives at the beginning of labour. Willughby condemns it. "In my first days of ignorance," he says, "I thought it was the best way to suffer midwives to stretch the labia vulvae with their hands and fingers when the throwes approached. But friendly nature in time shewed me my mistaking errour. Through the remoteness of severall places whereunto I was called, the women in the meane time keeping the labouring woman warm and quiet, and the midwife desisting from using violence, by such usage I found the women oft delivered before my coming; and so it was made manifest to mee that pulling and stretching of their bodies . . . did ever much hurt and never any good to women in distress to procure and hasten labour."

This reference to the women keeping the patient warm and quiet is one of several references to a feature that cannot fail to strike anyone who studies the medieval pictures of the lying-in chamber, which form one of the main sources of our knowledge of that period—namely the quite unnecessary number of persons in the room. Willughby speaks in one place of "going with the midwife apart from the company" to question her about her patient; and of another patient he "desired her, in the time of her travaile, not to have her chamber thronged with much company."

The presence of a man—even a physician—was in those days considered not merely an affront to the proprieties but as contrary to the interests of morality. When it was deemed necessary to call in medical assistance, great pains had to be taken to darken the room and to arrange the bedcurtains in such a way that the patient should avoid the humiliation of seeing a man in her bedchamber. All manual interference had to be performed under the bedclothes, so that the unhappy doctor was guided only by his sense of touch. To add

to his discomfort the lower corners of the bedcover or sheet were often tied round his neck.

Willughby throws an unconsciously amusing sidelight on this sort of thing when he records how his younger daughter, who practised as a midwife, when engaged to attend a lady of quality, was anxious because she had diagnosed a breech presentation. When delivery was approaching, he tells us, "at my daughter's request, unknown to the lady, I crept into the room on my hands and knees and returned, and it was not perceived by ye lady". In his haste to retreat before he was detected his examination was faulty and he diagnosed a head presentation; but his daughter was not satisfied, so ultimately, he says, "I crept privately the second time into ye chamber, and then I found her words true". That occurred in London, and perhaps the proprieties were less strictly observed in the provinces, for in his other cases there is no mention of any such precautions.

Willughby gives several instances of the barbarity of midwives. "A certain midwife carried a long knife secretly in her sleeve, with which she cut the womb whilst the woman was in great pain "-presumably an incision of the cervix. And again— "At the time of her travaile the child proffered an arme. This unnaturall birth dismai'd the mother and troubled the midwife. My company and assistance were wished for . . . but . . . she was perswaded to put herself under the hands of a wicked woman, that took upon her to free her of the child. This woman first cut off the childe's arme. Afterwards she divided the child into severall parts, to pull it forth by pieces. Her knife in doing this work was broken with many great notches as she hacked in her body. All which a Gentlewoman told mee, that was there present."

This reference to the presentation of an

arm is only one of a number so remarkable that we are driven to conclude that a transverse lie was one of the more common complications of labour. Probably it was related to the great prevalence of rickets affecting the pelvis, for it will be remembered that the first classical account of that disease was published in 1650 by Francis Glisson.

Eclampsia was not recognized as an entity in those days, but Willughby mentions several cases of convulsions, almost all fatal. In antepartum haemorrhage his treatment was immediate delivery, if need Of postpartum be by podalic version. haemorrhage Willughby gives a graphic account, and indicates that the accepted treatment was to give the yolk of an egg and either "to lay a napkin soaked in vinegar over the loins or to lay upon each groine a skene of raw silk moistened in water." He then quotes a list of equally futile remedies recommended by the ancients, and very properly concludes that "where flouding issueth with a stream, I shall not easily be perswaded that filipendula roots or succinum (amber) with yolkes of egges or such like will at all availe". Then strangely enough he lapses into something more worthy of Nicholas Culpepper. "I shall give more credence," he says "to the dung of asses, or stone horses, or of hogs, internally taken." He then continues "If possible I heartily could wish that some worthy practicer would be pleased to direct some powerfulle wayes or medicines to bridle this raging, destroying evil, and all succeeding ages would give him thanks." Shrewdly he observes, "This evil is never thought on but when casually it happeneth, so that then convenient medicines bee to seek and ever wanting . . . I confesse my ignorance and beleeve that there is no other but God alone, that can do this work to help the woman." Finally, with an amusing anticlimax, he concludes, "I suppose that astringent

injections may bee somewhat available"!

Willugby was a great believer in podalic version and breech extraction in all cases of contracted pelvis, and gives full instructions how to proceed. He repeatedly stresses that breech extraction is less painful to the mother than head-first deliverya point which is probably true and must have been of great importance in days when there were no anaesthetics and no forceps. He preferred the use of the hand to any instrument, but has a good word for the crotchet when the child is dead, although with due warning about the danger of wounding the mother. To'the "high and lofty conceited midwives, that will leave nothing unattempted to save their credit and to cloak their ignorance", he says, "let mee advice such women to learn to make use of the crotchet, rather than pothooks, pack-needles, silver spoons, thatchers' hooks and knives to shew their imagined skills . . . I have known the midwives and the places where they have used these follies to their women."

Caesarean section he deprecates. "I do not like it," he says, "... a practice to be condemned... I therefore pass it over with silence, being unwilling... to embolden any in these works of cruelty."

Willughby quotes Harvey no fewer than sixteen times, and frankly acknowledges his debt to his writings in the following terms: "Dr. Harvey's learned observations about the birth ought to bee esteemed for their worth and goodness. reading of them with a due observing of his method will bee sufficient to make a midwife to understand her calling. In his workes hee wisheth midwives not to be too busy at the first approaching of labour, by striving to hasten or promote a sudden or quick birth; but willeth them patiently to wait on Nature, to observe her ways, and not to disquiet her for that it is the sole and 

Dr. Harvey's directions and method, the which I wish all midwives . . . to read over and over again, and in so doing they will better observe and understand the sayings and doings of that most worthy, good and learned Dr. whose memory ought to bee had for ever in great esteem with midwives and child-bearing women."

I have quoted Percival Willughby at some length because he gives us a clear picture of the practice of midwifery in the seventeenth century, as well as an estimate of the value placed on Harvey's obstetrical writings by a highly intelligent contemporary, who shows evidence in his own writings of familiarity with all the obstetrical literature, both English and foreign, of his day. But let us now turn to Harvey's own work.

What he writes on midwifery proper is contained in three brief essays on "Parturition", on the "Membranes and Fluids of the Uterus", and on "Conception ", which form the concluding chapters of his long Exercises on the Generation of Animals, published in 1651 when Harvey was an old man in retirement. The De Generatione is devoted to natural history and embryology, and while it reveals Harvey's genius in his transcendent capacity for taking pains and the almost meticulous accuracy of his observations, it is in other respects on a level below that of his immortal essay De Motu Cordis. It is unfinished, but the nature and magnitude of the subject are such that at no epoch could the observations of any man claim to be complete. When we remember that Harvey delayed the publication of his De Motu Cordis for years until he could regard it as complete and definitive we may well sympathize with his reluctance to permit his friend, Sir George Ent, to supervise the publication of what he probably regarded as merely an inchoate collection of notes on

It is below the level of the De Motu Cordis also in that the issues tend to be confused with speculative suggestions, and that throughout there is evidence of much less of that freedom from the bondage of ancient authority which is one of the glories of his earlier work. The teaching of Aristotle and of his own Paduan professor, Fabricius of Aquapendente, is everywhere examined at tedious length. "When I find I can make nothing of Aristotle upon a particular topic," he says, "I straightway turn to Fabricius," and only then does he proceed to unfold his own views. Nevertheless when we recollect that Harvey had no microscope except a simple lens to aid him, we cannot fail to be impressed by the greatness and freshness of his contribution to embryology. He it was who first propounded the generalization "ex ovo omnia animalia." He it was who first formulated in English the doctrine of epigenesis—that is to say, the growth and development of an organism from a simple germ as opposed to the then prevalent view that the germ contained a pre-formed miniature model of the organism, which merely required to be, as it were, unfolded. Competent commentators have pointed out that Harvey's conception of epigenesis falls far short of what is now meant by that term, and indeed differed little from that of Aristotle. But it is worth remembering that it took two hundred years of subsequent experience with the compound microscope to establish the doctrine beyond criticism, so that we might say that the science of embryology itself developed by a process of intellectual epigenesis.

It was Harvey who first described the difference in colour between the lungs of a foetus which had breathed after birth and of one which had not—a point familiar to students of medical jurisprudence.

Regarding the problem of conception Harvey not unnaturally confesses himself baffled, for without a compound microscope it was impossible for him to see the spermatozoon. He falls back on the conjecture that conception is the result of an "idea" excited by coitus, and somewhat analogous to the conception of an idea in the brain. Incidentally he describes the condition of pseudopregnancy, which came to the fore again recently in the early days of sex-hormonology.

But it is the short chapter on parturition that interests us at this time. This was the first original work on the subject by an Englishman, and that surely justifies his being called "the Father of British Midwifery." It seems probable, however, that he wrote more upon the subject in his missing manuscript, Medical Observations, for he specifically refers to it and quotes one case-history from it.

To analyze the chapter in detail would weary a hungry audience, for it would entail repetition of the sort of things I have already quoted from Willughby. What has struck me most in perusing it is the almost amusing way in which, at every possible point, Harvey dashes off into comparisons drawn from his favourite subject of comparative anatomy and physiology. That, of course, is where his greatest interest lay. We must not forget that Harvey was primarily an anatomist. His genius as such lay in his concentrating upon function rather than form, and after the functions of the heart and blood-vessels his main interest was in the functions of the reproductive organs. I imagine that his interest in midwifery derived from that. Moreover, if we keep in mind the narrow scope that was open to the medical practitioner in midwifery in his day, we are driven to the conclusion, which seems to me to be confirmed by his writings, that Harvey's familiarity with abnormal midwifery was probably greater than his personal experience with natural delivery.

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After all, Harvey lived at the very beginning of the period of two hundred years that saw the care of the pregnant and parturient woman pass gradually from the midwife to the medical practitioner.

Of the way in which the outlook and the interest of the naturalist dominate those of the obstetrician let me give you two examples. He states that as labour approaches "the cartilaginous attachments of the pelvic bones so lose their rigidity that the bones themselves yield readily to the passage of the foetus, and thus greatly increase the area of the hypogastric region". That had been the teaching ever since the days of Soranus fifteen centuries earlier, but as a matter of fact it is a phenomenon much more recognizable in the lower animals than in the human species. Again he says that "although in women, as a general rule, the membranes are ruptured before the escape of the foetus, it is not universally so, nor does it hold in the case of other animals which bring forth their young enveloped in the membranes." He then goes on to say that this latter kind of birth appears to him "by far the most natural "-a point which no one whose interests were primarily obstetrical would be likely to dwell uponand supports his view by adding that "it is like the ripe fruit which drops from the tree without scattering its seed before the appointed time. But when it is otherwise, and the placenta subsequently to birth adheres to the uterus, there is great difficulty in detaching it, grave symptoms arise, fetid discharges and sometimes gangrene occur, and the mother is brought into imminent peril."

Harvey believed in superfoctation and gives several instances of its apparent occurrence. He thought the onset of labour was due to the liquor amnii, admirably suited, as he believed, to the nourishment of the foctus, either failing or becoming

contaminated with excrementitious matter. He supports the Hippocratic view that the birth of the child is largely the result of its own efforts, but he admits that the uterus also plays a part, as for example when the child is dead. "It is the foetus itself," he says, "which, with its head downwards, attacks the portals of the womb, opens them by its own energies, and thus struggles into day." The naturalist then emerges and he bolsters up his argument by reference to birds and insects and fishes which "are born by their own will and powers".

Harvey gives a clear account of the involution of the puerperal uterus, and joins with Fabricius in marvelling at this process. "It is indeed most wonderful," he says (and every obstetrician will echo his words) "and quite beyond human reason how such a mass can diminish to so vast an extent in the space of fifteen or twenty days"-and had the clinical themometer been in existence, he might have added "without any rise of pulse-rate or temperature." He points out that such rapid absorption does not occur with other tumours or abscesses, and concludes "Yet this is not more worthy of admiration than the other works of Nature, for all things are full of God, and the Deity of Nature is ever visibly present."

The placenta he thought to be an organ akin to the liver—the jecur uterinum of the ancients—and the mammae, serving to provide nutriment for the foetus. He agrees with Arantius that there is no direct communication between the foetal and the maternal blood and, incidentally, it will be remembered that in the De Motu Cordis he described the foetal circulation with remarkable accuracy. At this point the naturalist thoroughly enjoys himself in describing the varieties of placentation in different species of animals.

On the actual management of labour Harvey writes but little—so little indeed

that we are compelled to conclude that Willinghby must have had access to his lost Medical Observations. But what he does say is timely and wise, especially when read against the background of the sort of practice by midwives mentioned by Willughby. It amounts to the advocacy of those greatest of desiderata in all obstetricians—patience and gentleness. wives are much to blame," he says "especially the younger and more meddlesome ones who make a marvellous pother when they hear the woman cry out with her pains and implore assistance, daubing their hands with oil, and distending the passages, so as not to appear ignorant in their art—giving besides medicines to excite the expulsive powers; and when they would hurry the labour, retarding it and making it unnatural, by leaving behind portions of the membranes or even of the placenta itself, besides exposing the wretched woman to the air, wearying her out on the labour stool and making her, in fact, run great risk of her life. In truth it is far better with the poor and those who become pregnant by mischance, and are secretely delivered without the aid of a midwife; for the longer the birth is retarded the more safely and easily is the process completed."

In trying to summarize Harvey's contribution to midwifery I would say this. Apart from his work in the kindred subject of embryology, upon which I would not venture to comment, and apart from the mere fact of his priority as the first Englishman to write on midwifery, we may claim that he first set the processes of pregnancy and parturition—of "generation", to use his resounding classical term—in alignment with physiology, by bringing to bear upon them his exceptionally wide knowledge of what we would now call biology. That alone was a great achievement, and in his

own day his teaching must have come as a ray of sunlight piercing and dispersing the fog of ignorance and superstition.

In the application of medicine and surgery to midwifery he laid down the great governing principles of patience and gentleness, and it is inspiring to think that these characteristics, coming so-to-speak from the fountain-head, have persisted as features of British midwifery to the present day. We may safely interpret Harvey's advocacy of patience as meaning not a blind waiting upon Nature, but waiting with a watchful expectancy which does not preclude a readiness to interfere when Nature shows signs of faltering. Such was the natural evolution of his teaching that has come down to us through men like William Smellie, William Hunter and Thomas Denman. It is recorded of one of Denman's pupils, Johann Boër, sometimes called "the Father of German Midwifery", that when he became the first professor of the subject in Vienna, he adopted British methods, because "he had learnt in France what Art, in England what Nature, can do.''

British midwifery was indeed fortunate in having a man like Harvey as its "father", and if the quantity of his writings on midwifery seems to be in inverse proportion to their quality, what matters it? It is quality, not quantity, that commands remembrance. What one of Harvey's great contemporaries, Ben Jonson, said about the lives of men applies with at least equal force to their writings:

"It is not growing like a tree In bulk doth make men better be;

\* \* \*

In small proportions we just beauties see; And in short measures, life can perfect be.

# VAGINAL HYSTERECTOMY FOR CANCER OF THE UTERUS AND VAGINA\*

BY

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Tracing the historical development of gynaecological operations we see that in the early stages of gynaecological surgery, at the time of still imperfect asepsis, the surgeons preferred vaginal to abdominal methods. They rightly feared to open the abdominal cavity, whereas now a laparotomy in itself involves hardly any danger to the patient. In those times, therefore, surgical methods sought to avoid the dangerous abdominal approach. tendency was most evident in the surgical treatment of carcinoma of the cervix. When Freund, in 1878, began to perform the radical abdominal operation for carcinoma of the cervix, his operative mortality, and that of his followers, was 70 per cent. It is, therefore, easy to understand that the first enthusiasm for this operation soon diminished. When a few months later Czerny published his method of vaginal hysterectomy, the mortality of which was much lower, 32 per cent, surgeons in general became interested in this less dangerous surgical measure.

But since the end-results of Czerny's original operation were unsatisfactory, interest in the abdominal method did not diminish. The development of Wertheim's radical abdominal hysterectomy partly suppressed the interest of the majority of surgeons in the vaginal approach. A few re-

mained faithful to it; they kept working on it and pointing out its lesser danger. They tried to improve their methods in order to obtain better results. It was mainly Schauta of Vienna who perfected the technique of vaginal hysterectomy, and credit is due also to the French surgeons, Cunéo and Picot; the followers of the Vienna school, Peham, Amreich and Halban; and Stoeckel of Berlin. All these surgeons assisted the development of the operation, and the improvement of its technique. chardt's paravaginal incision, which some surgeons perform on both sides, made the field of operation markedly more accessible.

The Cunéo-Picot perineal crescent incision allows an even better access to the pelvic organs, as I myself have confirmed. By this incision the levatores ani are immediately exposed, giving access to the paravaginal tissue.

When performing radical vaginal panhysterectomy surgeons use two different methods of approach. Some of them start in front, displace the bladder, free the ureters, ligate the uterine vessels, free the parametria and finally the uterosacral ligaments. Schauta, Stoeckel and Cunéo-Picot operate in this way. Peham, Amreich and Halban, on the other hand, start by opening the pouch of Douglas and by cutting the uterosacral ligaments. Thus they free the uterus so that it can be brought down to the vaginal introitus and even

<sup>\*</sup> This definition of the technique of the vaginal operation was first published in Rozhl. v chir. a gynaek. (část gynaek.), 1934, 13, 83.

beyond it; this facilitates considerably further dissection.

When operating on such cases the aim must be to remove the whole of the uterus, a sufficient part of the upper vagina and, most important, as much of the paravaginal and parauterine tissues as possible. This particular object is much better obtained by the vaginal than it is by the abdominal operation. Lymphatic glands, situated farther away from the uterus, in the course of the common iliac vessels, can be removed in this way only if they are enlarged and But since the operation is palpable. intended only for Grade I cases of carcinoma of the cervix, when as a rule the glands are not yet involved, it need not be feared that metastases in iliac glands may be overlooked.

I have adapted my method of performing vaginal radical hysterectomy to the anatomy as described by Amreich-Peham. I provide access to the pelvic organs by a semicircular incision of the perineum as recommended by Cunéo-Picot.

#### DESCRIPTION OF THE OPERATION.

Pre-operative treatment. The surface of the tumour is curetted and then cauterized with a hot iron, or electro-coagulation. This preparation is considered of vital importance to prevent infection and the implantation of tumour cells into the wound.

After this the vulva and its surroundings, as well as the vagina, are disinfected with tincture of iodine and the vagina wiped out with 5 per cent silver nitrate. Then a strip of antiseptic gauze 20 inches (50 cm.) long is packed into the vagina and left there during the whole operation.

The operating field is then infiltrated with novocaine or, more recently, with percaine-adrenaline solution. General anaesthesia is thus postponed, and the operating field is rendered bloodless. The infiltration of the tissue facilitates the dissection of the

vagina from the neighbouring structures. This is recommended by Stoeckel as the best means of preventing excessive bleeding.

The Operation.

I. The semicircular incision into the perineum, freeing the vagina from the rectum.

A transverse semicircular incision is made 2 cm. posterior to the frenulum and extending to the level of the ischial tuberosities (Fig. 1). The skin is retracted in the neighbourhood of the frenulum by means of two Kocher forceps. The assistant pulls on these forceps anteriorly, while the surgeon, using blunt and sharp dissection, penetrates into the recto-vaginal space (Fig. 2).

In the lower part of this space the connexion between vagina and the anterior wall of rectum is rather close and here the French authors place the "rectovaginal muscle". It is necessary to use scissors and to cut this connexion without damaging the sphincter. In the upper part the connexion between the vagina and the rectum is very loose.

2. Forming the Cuff of the Vagina.

The posterior wall of the vagina is cut through sagitally between the forceps to the level at which the vagina will be removed. From the end of this sagittal incision a circular incision is made around the whole circumference of the vagina (Fig. [In cases of carcinoma of the vagina the incision is made at the level of the hymen or  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (1 to 2 cm.) above it.] It is preferable to make this incision, as recommended by Peham, with a Pacquelin electro-cautery which is not quite red-hot. The whole thickness of the wall must be cut through, together with the fascia, the so-called perivaginal fibrosa (Halban) connected with it, especially on the front wall. This fascia must remain connected with the vagina during the whole course of the dissection. In this way the displacing of the bladder and ureters at a later stage is very much facilitated and the uterovaginal plexus remains undamaged in this fibrous layer.

The circular incision through the vaginal wall having been made, the wall is freed about  $\frac{3}{4}$  inch (2 cnî.) upwards from the urethra, bladder and rectum; this vaginal cuff is closed by placing Kocher forceps or silk stitches on the anterior and posterior vaginal walls. In the course of the operation these forceps or stitches are used as retractors (Figs. 4 and 5).

Having closed the vaginal cuff the instruments and gloves are changed and the operation continues under aseptic conditions.

## 3. Dissection of the Paravaginal and Parametrial Tissues.

This is performed before the dissection of the bladder and the uterus. The methods of Peham-Amreich and Halban are fol-These surgeons found that by cutting through the posterior and lateral parametrial tissues the whole uterovaginal tract can be brought down and the dissection of the bladder and ureters facilitated. This phase of the operation is most important, because the more extensively the parametrium is removed the better the prognosis for the patient. Amreich-Peham use the Schuchardt incision and Halban uses his lateral vaginal incisions. I have found the semilunar perineal incision, which exposes the edges of the levators, to be the most satisfactory.

Using the finger or a small swab, I dissect along the edge to the inner surface of the levators, leaving their fascia undamaged and displacing the rectum, vagina and bladder from the lateral wall of the pelvis (Fig. 6). First the rectum is displaced to the lateral edge and anterior surface of the sacrum, then anteriorly a finger displaces the

vagina, uterus and bladder from the inner surface of the levators. Blunt dissection is usually possible. It is necessary to work by sharp dissection initially, because the fascia of the urogenital diaphragm inserted into the inferior ramus of the pubis is tough. Amreich suggests that this fascia should be separated by sharp dissection from the pubic bone and from the obturator fascia by an incision parallel to the inferior pubic ramus. It is necessary to dissect sharply in the deeper parts, where the arcus tendineus is firmly attached to the fascia covering the levators (Fig. 7).

By dissecting the organs of the true pelvis from the inner surface of the levators a wide area is exposed, bounded in front by the paravesical space, and at the back by the pararectal space. These spaces are separated transversely by the cardinal ligament of Mackenrodt (Fig. 8).

## 4. Dissection of the Uterosacral Ligaments and of the Rectum.

Work is continued in the rectovaginal space, bordered by the extraperitoneal fibres of the uterosacral ligaments. It is necessary to separate these by sharp dissection from the rectal wall as far posteriorly as possible, and great care must be taken to avoid any damage, both to the rectum, which is wide here (the ampulla), and its circular vessels. The best way of dissecting the uterosacral ligaments is to introduce a vaginal speculum into the rectovaginal space and to depress the rectum. The pararectal opening is enlarged by a broad retractor introduced laterally (Fig. 7). The fibrous wall appears distinctly between the two spaces. This is cut gradually, keeping close to the rectal wall and ligating bleeding vessels, which form an anastomosis between the haemorrhoidal and the uterovaginal plexuses. After freeing the ligament from the rectum, the lateral part of

it is separated as close to the pelvic wall as possible. Metastases are frequently found here which, if left, would render the operation useless.

5. Opening the Pouch of Douglas.

The posterior speculum depresses the rectum and the anterior speculum widens the rectovaginal space by pressure on the dissected vagina and uterus. The peritoneal fold of the pouch of Douglas is found, and opened by a transverse incision. The peritoneal portions of the uterosacral ligaments are then cut through (Fig. 9).

6. The Ligature and Division of Mackenrodt's Ligament and of the Uterine Vessels.

The paravesical space is separated from the pararectal space by a strong fibrous band, the cardinal ligament or transverse cervical ligament. After this has been freed—taking great care to avoid the ureters—it is ligated as laterally as possible, close to the lateral pelvic wall. Medial to this ligature the ligament is incised (Fig. 8). The uterine artery becomes visible. Its ligature is usually accomplished easily because the loop of the ureter running round the uterine artery to the bladder has been displaced to some distance from the uterus by pulling down the whole of the uterovaginal mass.

7. Displacing the Bladder and Ureters; Opening the Uterovesical Peritoneum.

Work is only now commenced in the uterovesical space and on the uterovesical ligaments. Having cut the vaginal wall and its fibrous underlay together, the bladder can easily be dissected from the vaginal wall. The connexion is more intimate in the region of the urethra and of the trigone of the bladder. The operation is carried out bluntly in the region of the uterovesical space proper; laterally, where the uterovesical ligaments are

stronger, sharp dissection is necessary (Fig. 10).

Stoeckel advises, at this point, that the bladder should not be pressed too much upwards as this would make the outlines between the bladder and the vagina indistinct and the tissues would be deprived of blood.

Amreich advises that the bladder should not be displaced too high in the midline before the uterovesical ligaments are cut up to the same level. The best way is to proceed in the midline only slightly higher than in the lateral parts.

After this procedure the uterovesical fold of peritoneum is found and cut transversely (Fig. 11).

8. Cutting through the Lateral Parametrial tissues.

Having stretched the lateral parametria they are incised as laterally as possible, taking care not to remove too much of the peritoneum, and not to damage the ureters.

9. Cutting through of the Broad Ligaments and Infundibulo-pelvic Ligaments.

This can be done before the phase of the operation described in paragraph 8. The assistant pulls the forceps or stitches closing the vagina down and to the opposite side, and the round and infundibulo-pelvic ligaments are cut through (Fig. 12).

10. Closing the Peritoneal Cavity.

A good postoperative course depends on a careful closure of the peritoneum. The stumps of the infundibulo-pelvic and round ligaments are fixed extraperitoneally to the poles of the peritoneal wound.

II. Completing the Operation.

The bladder is fixed proximally with a few stitches. The rectum is covered by the edges of the levators, which are stitched together as in a posterior colporrhaphy. The remaining space is packed with

iodoform gauze. The semicircular incision in the peritoneum is closed by a few deep stitches, and after the suture of the frenulum the skin is stitched.

#### 12. Postoperative Treatment.

A permanent catheter is usually inserted for 4 to 5 days. The bladder is washed out at least twice a day under low pressure with a small quantity of liquid. The iodoform gauze pack is left in situ for 5 or 6 days, then it is gradually shortened, and removed completely on approximately the 10th day, depending on the patient's condition. If the temperature rises removal of the gauze is started earlier. The wound heals completely after several weeks.

There is only one real objection to the vaginal approach in cases of carcinoma of the cervix: the impossibility of picking out and removing completely the iliac lymphatic glands. But in view of the fact that far more of the parametrial tissue is removed by the vaginal than by the abdominal operation; that the glands in patients with Grade I carcinoma are only rarely involved; and lastly, that by supplementary X-ray and radium treatment the remaining glands can be destroyed, the abdominal approach cannot be considered as the more reliable one.

The advantage of the abdominal method is the clear operating field and the better access to the pelvic organs. The technique of abdominal operations is in most cases an easier one, not demanding so much experience or exertion of the surgeon or of his assistants. Laparotomy can be learnt more easily, the assistant can be guided directly by the teacher. When operating vaginally, on the other hand, the surgeon must proceed far more individually, often even the assistant sitting next to him cannot follow the operation completely. Vaginal operation certainly re-

quires more experience and skill than a laparotomy.

On the other hand, the pelvic fascia is more easily accessible per vaginam and, especially when operating on cases of carcinoma, it is most important to examine and remove the paravaginal tissues and parametrium as thoroughly as possible.

Another and perhaps the chief advantage of the vaginal operation is the fact that the patient withstands it much better than laparotomy. It is necessary, also, to stress the psychological factor. The patient finds it easier to undergo an operation when she is not going to be "cut", that is to say, when there is not going to be any external wound or scar left. She cannot help but consider such a proceeding to be less serious and less dangerous than an abdominal operation. It is true that, with modern methods of asepsis, anaesthesia and surgical technique, we need not be afraid to open the abdominal cavity. Yet, the effect on the patient is a very different one if the peritoneal cavity is widely open for a long time, as is usual in a laparotomy, or only for a short while, and in quite a narrow space, as in the vaginal operation. operation does not require the Trendelenburg position, or narcosis, or anaesthesia as deep as during a laparotomy. intestines suffer much less.

Therefore the postoperative course of the patients operated on vaginally is a smoother one. There is less postoperative shock, no intestinal paralysis. The patient is fit immediately after the operation; she does not have the impression that she has been operated on at all; intestinal peristalsis often reappears very soon. The appetite comes back much sooner than after laparotomy. Postoperative pain is much less, because the peritoneum and the intestines were not handled. The surgeon who has seen even old and decrepit patients (such as those in the 6th and 7th decades, with

carcinoma corporis) recovering well after extensive vaginal operation, will not regret the effort which the mastery and performance of these operations requires.

The greatest advantage of the vaginal approach is its lower immediate mortality-rate. I shall not mention other surgeons' statistics here, but communicate my own experience only.

In the last 25 years I have operated on the following cases:

TABLE I.

		Initial mortality	
	Number of patients	Patients	Per
Carcinoma of the uterine corpus.			
Abdominal approach	h 19	I	5.0
Vaginal approach	135	2	1.48
Carcinoma of the cervi			•
Abdominal approach (Wertheim)	1 197	26	13.2
Vaginal approach	203	8	3.92
Primary carcinoma of	the vagma.		
Vaginal approach	8	0	— .

The above statistics derive mostly from the time when, lacking radium, I was forced to operate on patients in a more advanced stage of the disease, on Grade II, or even Grade III of carcinoma of the cervix. Later I was able to use radium and X-rays in all advanced cases.

Examining the postoperative results according to the grade of carcinoma, it is seen that the more advanced the tumour, the higher the initial mortality-rate, and the lower the number of cases alive and well after 5 years.

I am not able to produce my figures for more recent years because, during the German occupation of my country, I was deprived of hospital work, and it was made impossible for me to follow-up my cases.

Table II.

Carcinoma of the Cervix.

	I	Grade II	III	Total
Vaginal approach.				
Number of patients	53	54	16	123
Initial mortality	O	1	4	5
Mortality, per cent	O	1.8	25	
Cured after 5 years (per cent) .	83	38	25	
Wertheun opération.				
Number of patients	47	85	47	179
Initial mortality	1	7.0	18	26
Mortality, per cent	2.1	8.3	38	
Cured after 5 years (per cent)	82	37	10.3	

Table II proves that the results of the vaginal operation are at least as good as those of the abdominal one. The long-term results are even slightly better. The initial mortality after vaginal operations is definitely lower. Of course this mortality is higher if we include cases of more advanced disease.

At present, when advanced cases receive radiotherapy alone, and operation is reserved for cases of Grade I carcinoma, it is even more important to use a surgical method as little dangerous, and yet as successful, as the vagina-perineal hysterectomy described here.

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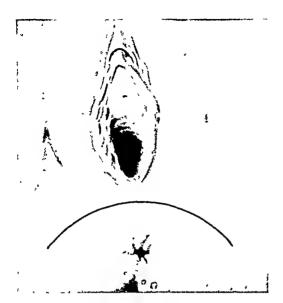


Fig. 1.

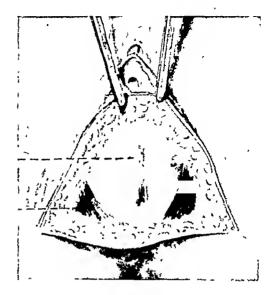
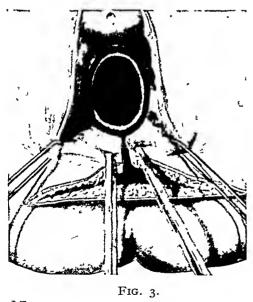
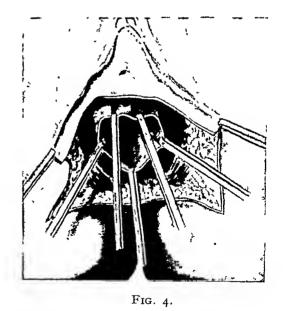


Fig. 2.





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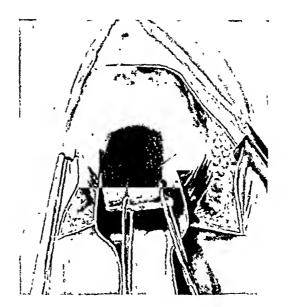


Fig. 5.

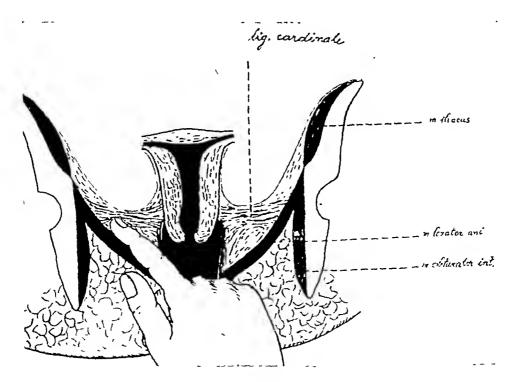
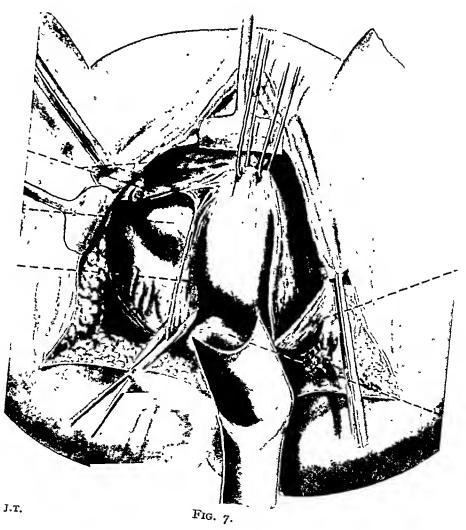


Fig. 6.



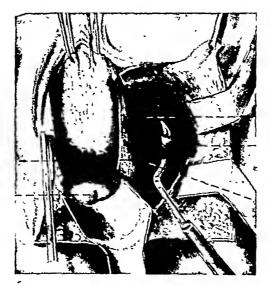
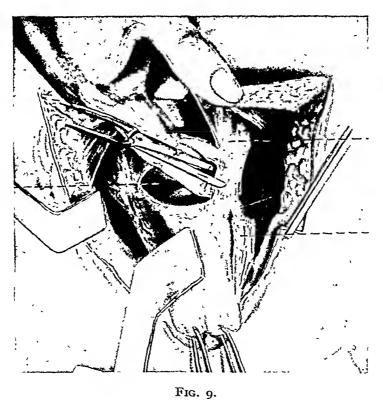


Fig. 8.



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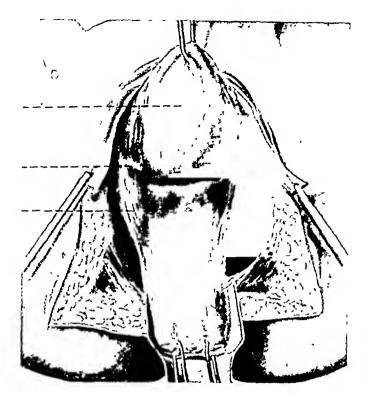


Fig. 10.

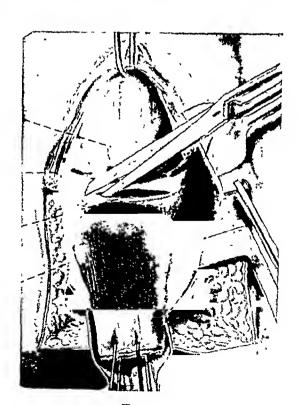
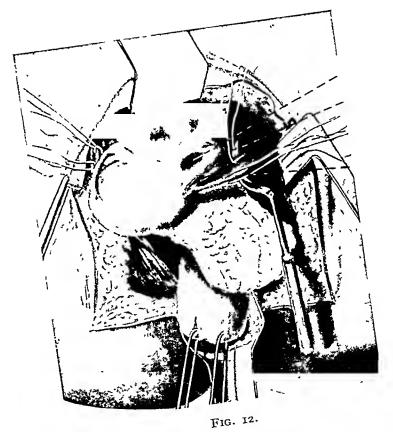


Fig. 11.



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### "MESODERMAL MIXED" TUMOUR OF UTERUS

BY

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Under the title "Mesodermal Mixed Tumours of the Uterus" Meikle (1936)—whose title is deemed apt, though lacking indication of malignancy—gave an account of these tumours and traced their history from Wagner (1854). Meikle observed: "the mixed tissues found in these tumours are essentially heterotopic to the uterus, and the tumours exhibit a high degree of malignancy."

Of references since 1936, 6 have been studied: Amolsch, A. (1939); Liebow, A., and Tennant, R. (1940, 1941); Glass, M., and Goldsmith, J. W. (1941); Lebowich, R. J., and Ehrlich, H. E. (1941); Ehrlich, H. E. (1942).

Eight Latin-American references in the Index Medicus to Rhabdomyosarcoma, in which no reference to "cartilage" is made, and several to Sarcoma botryoides of cervix, have not been studied.

On the question—What constitutes a "Mesodermal mixed tumour"?—Lebowich and Ehrlich (1941) state: "only 12 genuine mesodermal tumours of corpus acceptable by the pathologic criteria of Lawen were known at that date. The absence of striated embryonic muscle cells, so necessary for a pathologic diagnosis, serves to eliminate those cases described as adeno-sarcoma of Sophian." Again:

"diagnosis can be established with certainty only by demonstration of embryonal myoblasts in combination with I or more heterologous elements such as myxomatous tissue, cartilage, glands, etc." The authors eliminate such sources of confusion as carcinoma, endometrial polyp, ossifying fibroma, calcifying myoma.

In contrast with the restricted view of Lebowich and Ehrlich, Glass and Goldsmith (1941) review 94 alleged mixed mesodermal tumours of uterus and describe a case in which striated muscle was lacking.

Liebow and Tennant (1941) observed that diagnosis is based upon demonstration of unusual tissue such as cartilage, bone or striated muscle. Many instances are stated to have been missed because of the difficulty in demonstrating striations. same authors in the previous year had stated that 62 cases of mixed mesodermal tumours of the body of uterus were known. The tumours occurred in women beyond the menopause—the average age was 56.4 years. Symptoms of pain and haemorrhage existed for 29 weeks on the average. Only 4 of 29 patients were known to have survived 2 years or more; 19 of 28 were known to have succumbed. Death occurred usually within 33 weeks after diagnosis, and 52 weeks from apparent onset, and this

despite radical hysterectomy. The tumours were usually polypoid and arose from posterior cervix, but may obliterate the cavity, or consist of multiple polypi. The histology showed undifferentiated stroma, including cartilage, striated muscle, and "sometimes both." Metastases occurred to lungs and pleura. Metastic lesions were often atypical. "In vitro" cultures were investigated.

Amolsch (1939) stated that the mortality was 95 per cent, whatever treatment was adopted. "Rhabdomyoblasts are often overlooked." It is noteworthy that Meikle (1936) found no striated cells. His tumour was composed largely of myxoma and cartilage. Some parts of the tumour resembled spindle-cell sarcoma; giant-cells were not uncommon.

Ehrlich (1942) stated that the "number of acceptable reported cases is 14", and reported finding striated cells and "embryonal" cartilage in a tumour from a woman aged 55.

#### HISTOGENESIS.

Meikle (1936) suggested that cell-rests were actuated by hormonal disturbance. Liebow and Tennant (1940) supported Wilms intra-Müllerian inclusion of multipotential germs, rather than metaplasia. Lebowich and Erlich (1941) stated that an origin from embryonic cell-rests of the Müllerian duct "appears to be the most acceptable to-day, but it is not completely satisfactory." Willis (1948) suggests origin from neoplastic endometrial "which in the process of becoming neoplastic, has again become embryonic and has acquired unusual potencies for aberrant differentiation." Hartfall (1931) suggested histogenesis was "of great complexity". This would seem still to be true.

The suggestions made appear to be inevitably largely conjectural, and we do not propose to add thereto.

#### CASE RECORD.

A woman, aged 73 years, presented herself at hospital in March 1946, complaining of acute retention of urine (described as presenting symptom in several cases in literature), and a slight bloodstained vaginal discharge for 10 days. A mass was felt in the pelvis, and the bladder reached up to the umbilicus. After catheterization and rectal examination the diagnosis of multiple fibroids was made (14th March, 1946). Hysterectomy was performed. Normal postoperative convalescence followed and she was discharged, walking, from hospital on 14th April, 1946.

#### Morbid Anatomy.

The specimen consisted of uterus, Fallopian tubes and ovaries.

Ovary. A mass 1.2 by 1.8 by 1 inch, was seen in the ovary.

Uterus. Approximately 5 inches long, showed a dilated os and cavity. Five fibroids were present, the largest being approximately 1¾ inches in diameter. A ragged mass, 5 by 4 by 1½ inches, with green edges, was seen apparently arising from the region of the internal os and protruding.

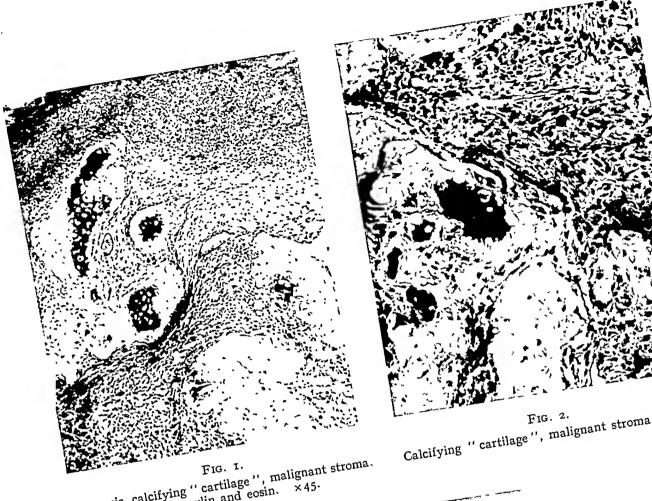
On bisection of the mass, areas of necrosis and also areas somewhat resembling cancellous bone in arrangement and hardness were seen.

#### Histology.

Ovary. The mass was apparently a pure fibroma; no "Brenner" elements were seen.

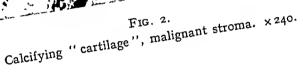
Uterus. The polyp consisted of anaplastic malignant cells, some of very large size. The appearances were variegated. Some areas resembled cartilage, and part of this was calcified. The several islets of apparent cartilage reacted somewhat variably with thionin and phosphotungstic acid haematoxylin; but appeared very similar to control cartilage when stained with safranine. It was thought improbable that any true bone was present. The cells in the "cartilaginous" ground substance appeared to be malignant cells. Strap-like eosinophilic cells were seen which showed longitudinal striation and, in several instances, well-defined transverse striation also; these cells had, usually, fantastically large nuclei of anaplastic malignant type.

It is submitted that the tumour complies



Necrosis, calcifying "cartilage", malignant stroma.

Haematoxylin and eosin. ×45.





Striated cell. Erythrosin and saffron. ×950,

with the restricted criteria of Lebowich and Ehrlich (1941).

Course Subsequent to Operation.

In mid-October, 1947, the patient consulted her doctor and complained of vomiting and abdominal pain. On examination ascites was discovered and this was tapped times. Nodules, deemed to be metastases, were palpated in the abdomen. There was now no vaginal haemorrhage and no sign of metastases in the lungs (a common site according to the literature). She died on 14th December, 1947. Postmortem examination, limited to the abdomen, was permitted on 16th December.

A mass, approximately 2 inches in diameter, was present in the lower anterior abdominal wall. Ascites was present. Nodules were observed in the liver, kidney and bowel and also in the pelvis, but not in the vagina. Portions of metastases from abdominal wall, spleen, liver, right kidney and wall of bowel, were sent to the laboratory.

#### HISTOLOGY.

The masses submitted consisted of undifferentiated anaplastic malignant neoplasm. No striated cells, or "cartilage" were identified. The masses were deemed consistent with metastases.

#### SUMMARY.

A polypoid tumour, removed with, and

arising from, the uterus of a woman 73 years old, revealed histological evidence of malignant rhabdomyomatous and chondomatous elements. It is submitted that it constitutes a "mesodermal mixed tumour", within the restricted definition of the recent literature, which is briefly reviewed.

We wish to thank Mr. W. Blackie and Mr. D. Brady for technical assistance, and Mr. T. C. Dodds for the photomicrographs.

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### SIR FRANCIS CHAMPNEYS, BT., M.A., M.D., F.R.C.P.

Address given by Sir William Fletcher Shaw, M.D., F.R.C.O.G., at the Centenary Commemoration Service held at St. Bartholomew-the-Great, Smithfield, on 25th March, 1948.

WE are met to-day to commemorate the centenary of the birth, and to give thanks for the life and work, of one of the notable leaders in medicine. This congregation, representing so many diverse organizations for which he laboured, is proof of the catholicity of his interests. From some of these, his school and his Oxford college, he derived great benefits which he repaid by a lifelong devotion and love. From others, the Royal College of Physicians and the three great hospitals whose staff he adorned, St. George's, St. Bartholomew's and the General Lying-in, he also derived great benefits, which he returned with great services in addition to his love and devotion.

Of the remainder here represented the balance sheet is chiefly on the debtor side. Some he helped in their foundation, and to all he gave unremitting labour, organizing ability, wise counsel and support.

It is well, therefore, that we should pause for a few moments in this busy and troubled world to reflect upon the man who left his mark on so many facets of public and medical life.

Born of an ancient line which traces its descent to Garcia de Ximenes, King of Navarre and Count of Champagne, whence the name Champneys, and established in this country by Sir John Champneys, one of the Conquerer's Knights, Sir Francis inherited characteristics which we proudly acclaim as English—love of his country, belief in his fellow men, hatred of injustice,

bulldog tenacity of purpose, a smiling face in defeat, a spirit of compromise in nonessentials, and above all, a transparent honesty and hatred of subterfuge.

A son of the Very Reverend William Weldon Champneys, D.D., Canon of St. Paul's, and later Dean of Lichfield, his youth was spent in a happy and sympathetic atmosphere with a deeply religious background, and religion remained, throughout his life, a main driving force and guide.

Born in the early days of Victoria's reign, when England's trade and wealth and overseas possessions were expanding by leaps and bounds, and when the preparation for a profession did not necessitate too early a specialized training, he received a sound classical education at Winchester, an education which remained a cultural background throughout his life.

In his early home he developed a habit of hard work which he retained to the end of his days and which, allied to a strong constitution and a sound intellect, brought their reward in a scholarship to Winchester, an Exhibition to Brasenose College, a First-Class in Natural Science, membership of the staff of St. George's, St. Bartholomew's and the General Lying-in Hospital, and finally the acknowledged leadership in the branch of medicine he had early adopted.

He firmly believed in a healthy mind being sustained by a healthy body, and he had a distinguished athletic career both at school and the university. Later, when a busy practice and irregular hours made organized games impossible, he kept himself in good condition with bicycling, walking and gardening.

One other characteristic derived from his ancestry and developed by training in a cultured background was his love of music, a love which remained a vital force throughout his life, bringing mental relaxation and pleasure in his most active years, comfort and solace in his declining and lonely ones. The organ was his earliest and remained his favourite instrument.

It is recorded that at the early age of 12, in the absence, through sudden illness, of the organist George Cooper, whose pupil he was, young Francis played the organ, although his feet could not reach the pedals, for the Sunday services in the nearby Church of St. Sepulchre, Holborn, and through this medium he has given us, amongst many others, the anthem and hymns sung at this service.

His work as an obstetrician and teacher in these three great hospitals gradually brought him renown until, in his heyday, he had one of the largest private practices, and was in constant demand all over the country and even on the continent—a life of unremitting toil and anxiety, possible only to one with the best of constitutions.

His marriage in 1876 to Virginia Julian, only daughter of Sir John Warrender Dalrymple, was a particularly happy one.

His wife brought to him new artistic interests and supplied the happy domestic atmosphere so essential for the relaxation of a man working to the limit of his powers.

It is, however, not as a clinician or as a teacher that his name remains alive to-day, but as one who gave, even in the busiest period of practice and later in his retirement, continuous labour and organizing ability to the foundation or support of movements for the betterment of his fellow men or of his profession.

He strongly supported Sir William Japp

Sinclair in founding the Journal of Obstetrics and Gynaecology of the British Empire in 1901, was one of the first directors of this Journal and became Chairman on the retirement of Sir John Williams in 1907. During the first Great War the publication was suspended but when it was revived as a monthly journal in 1921 he was persuaded, in spite of his age, to retain this post.

Of all these activities, the one which owes most to him and gave, even in his life-time, the greatest return to womanhood, is the midwives' service of this country, now one of the best in the world. This is his permanent memorial.

Although obstetrics, like general medicine and surgery, began its scientific foundation in the 16th and 17th centuries, since when our knowledge has gradually increased, little was done to improve the training of the midwives, who still continued to attend a large proportion of the confinements in this country. True it is that sporadic attempts were made in various centres and at different times, but there was no co-ordination and, at the end of the last century, the main mass of the midwives remained as in mediaeval times, drawn from the uneducated classes and largely self-trained.

This movement, good as it was, scarcely touched the fringe of the problem. Women were still free to practise midwifery without these certificates, and even if these had become universal there was no regularized training and no supervision of the work of those in practice.

In 1890 Champneys, then 42 years of age and in the full vigour of life, became Chairman of this board.

He quickly realized that the development of these poorly educated, partially trained handy-women into an efficient service could be done only by Government action and, for the next ten years, while at the very height of his busy practice, he set himself the task of persuading the Government to sponsor a Bill which would control the training and examination of those wishful to enter the service, and the supervision of those in practice over the whole country.

This suggestion raised much opposition. From the medical profession, who feared that a well-trained body of midwives would reduce medical obstetric practice; from the midwives who were already in practice and feared supervision of their work and comparison with the new order; and from the laity who would be called upon to provide the money.

Champneys, and the men working with him, by education and persuasion gradually bore down all opposition and the Bill became law in 1902, setting up the Central Midwives Board with charge of a Register of midwives, to which candidates were to be admitted only when the Board was satisfied with their training and examination, and from which names were to be erased when the Board was dissatisfied with the standard of practice.

To obtain an Act to train, examine and supervise the whole body of midwives was one thing, to administer it and especially to raise the standard of the service so as to attract to it women of a higher social status and education was a much more difficult matter.

Although the ultimate object was to pro-

vide women with better attendance at their confinements and to reduce maternal mortality, it was impossible to suspend the physiological activity of parturition until such time as the service was reorganized, and even if this had been possible it would have removed the very teaching material upon which the new service depended.

The administration of this Act was invested in the new Central Midwives Board, whose first chairman Champneys became.

At that period there were, scattered over the whole country, only a small number of hospitals with a trained obstetric staff. To arrange for the training, which for the first time was to be institutional, of a sufficient number of candidates to replace the yearly wastage; to organize examinations which could be gradually raised in standard; to attract to the service candidates with a higher general education; above all, to supervise the work of those in practice so as to raise the general level of their work without removing so many that the service might break down before the newly-trained candidates could take their place, was a Herculean task.

That these objects were attained and the service gradually raised to its present position without any reduction in the attendance upon parturient women in the transition period was due to the Central Midwives Board and above all to its Chairman, Sir Francis, who retained this post for 28 years, and through all this long period guided and directed it on practical, commonsense lines.

Under a Chairman with less vision, faith and dynamic force, progress would have been slower and probably halted at a lower level; under one with less patience and less realization of the practical issues the result would have been chaotic.

It is only those who worked with midwives practising in the period before the Act who can fully appreciate the changes which have been wrought in that service.

As women devoted to their work and to their patients, willing at all times to sacrifice leisure and comfort to their duty, I retain the happiest memories of them, but in training and professional knowledge many were little better than the untrained handy-women they were supposed to replace. The fees, in those far-off days, were so low that well-educated women were not attracted to the service; the candidates generally being married women with families, or widows, who wished to supplement the family income.

So poor was the general standard of education of those in practice that many of them could not understand, and therefore derived little benefit from, the course of lectures they had attended, while their clinical training had consisted only in the attendance upon a limited number of confinements with some midwife, who, herself, had received a training little better than that of a handy-woman.

Now the midwife is drawn from a higher social scale with good general education, and the majority are already State Registered nurses.

Their training is long and thorough, and most of it is institutional. The midwives now have their own College, and their position is assured.

That this profession has been raised from what it was forty years ago to what it is to-day, one of the finest midwives' services in the world, and this without depriving any woman in the transition period of the help which is her due, is the most enduring monument to his memory.

One disadvantage of a centenary celebration is the improbability of the address being given by a contemporary.

Although I can claim personal knowledge of Sir Francis only during his last five years, I knew of his work and his recognized leadership throughout my whole professional life.

As a medical student I heard the controversies raised by his Midwives Act. Soon after the passing of this Act, I was, amongst other duties, responsible for some years for the work of a group of midwives admitted to the new Register by virtue of the fact that they were in practice when the Act was passed, and for some years I was an Examiner for the Central Midwives Board. I was thus in a position to note the gradual change in training, examination, and in the status of the midwife, brought about by his wise administration.

It was only in 1925 that I met him in person, when a group of us were laying plans to found what has since become the Royal College of Obstetricians and Gynaecologists.

In those days most of the driving force and optimism for this scheme came from outside London and it was felt, at this date, that our path would be made easier if it was known that we had the support of some of the seniors and acknowledged leaders in London.

One of our group, therefore, arranged a dinner party to which were bidden five of these seniors to meet a small number of our group, and it fell to my lot to explain what we had in mind and to try to convert the seniors to it.

Sir Francis was then 77 years of age, but would easily have passed for a man of 60, and in appearance and mental vigour was a younger man than several of the other guests who, in fact, were much his junior in years.

Rather below middle stature, with a sturdy frame and broad shoulders. An aristocratic face with well-formed nose and determined chin, blue piercing eyes which looked directly at you when he spoke, a sweeping, white moustache, and his head still covered with a good crop of beautiful

white hair. A strong, compelling face upon which authority sat lightly as upon one born to lead. A face saved from hardness or fastidiousness by a mobile mouth and the sweetness of his smile, which frequently irradiated his face when in conversation.

During dinner it was clear that his leadership was acknowledged and that, if he were convinced and became an enthusiastic supporter, our task would be lightened.

That evening, although so long ago, is deeply impressed upon my memory.

Seated at one end of the table opposite to our host, he kept the conversation circulating upon interesting and amusing topics. After dinner, when the servants had withdrawn and we opened the serious business of the evening, his receptive mind rapidly grasped the essentials while his shrewd questions uncovered the doubtful points.

None of us at that dinner party guessed that this cheerful, alert, charming man, apparently without a care in the world, had arranged to enter a nursing home the following day for a serious major operation. It was from the home that he wrote to me the first of the many letters which ceased only with death, five years later.

From the first I was greatly attracted to him and as he took the trouble to show that he liked me, this attraction deepened into something much richer during these five years up to his death.

During this time we corresponded regularly, frequently met, and on one occasion he spent a week with me.

The affinity no doubt was strengthened by the fact that our minds normally ran along the same lines, and therefore then we were generally acting together in the many discussions and disputes amongst those founding the College.

When, after long delay, the College was founded, age and the state of his health precluded the possibility of his being the first President, and so a special office, that of Vice-Patron, was devised, an office which has not been filled since his death.

Blessed with a strong constitution and abounding vitality, he had been able to devote to public objects an amazing amount of time and energy for one so busy in the practice of his profession and now, in the twilight of retirement, he continued his support of objects which his still alert and active brain knew to be of public service.

If I were asked to name his most characteristic feature it would be his fearless honesty and loathing of anything underhand. On many occasions the object we had at heart could have gained a point by subterranean methods, but these he strenuously opposed.

His principle in life was that an object worthy of attainment should be openly proclaimed.

It was this transparent honesty of purpose, combined with patience and a gift of exposition, which accounted for the success of the objects he had at heart, and which gave him his leadership.

No one could be long in his presence without being aware from whence sprang his strength and his patience.

Brought up in an evangelical household, his early beliefs were strengthened and broadened by his happy married life. There was nothing sanctimonious or depressing in his Christianity and his presence brought out the best in other men.

My last visit to him was in his beautiful home in Nuttley, a short time before his death.

He was cheerful and bright, and his conversation was chiefly about the College and its future development. He was gravely ill and we both knew it was the last time we should meet. His mind was as clear as ever, and his remarks as shrewd. He had suffered much pain and distress, but not a

word of complaint was uttered, only gratitude to the doctors and nurses for the relief they had afforded him.

He impressed me as being pleased to relinquish a life which had become a burden and, since the death of his wife, lonely, and that he looked forward with faith to their reunion.

And so I left him, surrounded by all that was dearest and had most influenced his life.

Attended by his family with loving care he overlooked, through the large window, the garden he had made and tended and the lofty drawing room with his organ, his daily solace, and Watt's portrait of his wife, loving companion of 46 years.

And at the side of the room his *prie-dieu*, no mere piece of furniture or decoration, from whose habitual use he drew his strength and inspiration.

#### THE DIFFICULT DILATATION

BY

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In the Journal of February, under the above title, Professor E. Farquhar Murray describes a method of overcoming obstruction at the internal os in cases of difficulty. For several years I have been employing a different method with success in such I intend to try out Professor Murray's method, which may perhaps be better than mine, but it might be of interest were I to describe the manipulations I employ. Fenton's dilators are used, having a double curve and being easily controlled. They are capable of exercising powerful leverage and because of this care must be taken to avoid undue pressure, and also to control the instrument so as to avoid any jerking, otherwise damage might be done. The principle adopted is to share the counterpressure between the volsellum and the pelvic floor. As the dilators are passed

the hold on the volsellum is relaxed so as to allow of the cervix being pushed up until the resistance of the pelvic floor is felt. Then by careful and persistent pressure the dilator, kept exactly in the proper direction, is pressed slowly through the obstructing internal os. During this action the volsellum is held fairly firmly, but not so firmly as to risk it being torn from its hold on the cervix. The resistance is made up of the pelvic floor and the grip on the volsellum. The procedure is helped by leverage of the distal curve of the dilator against the Sims speculum. This method may appear dangerous, but it is not really so in skilled hands and it is certainly effective in preventing tearing of the cervix by the volsellum and in attaining the dilatation of the cervical canal and internal os required.

#### A CASE OF EXTRAUTERINE PREGNANCY

BY

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AND

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An abdominal pregnancy which proceeds to maturity is sufficiently rare to be always of great interest. Yet there is quite an extensive literature dealing with such cases.

Thus, Cornell and Lash, in 1933, review 236 cases and give the maternal mortality as 14.3 per cent. They say that preoperative diagnosis occurred in less than 50 per cent of the cases.

Gardner and Middlebrook (1944) give a comprehensive survey of 258 cases, and describe one case of their own which was terminated at the 7th month. They give an account of the factors which aid in the diagnosis of the condition, but state that only 83 out of 181 were diagnosed correctly before operation. They find the incidence of foetal deformities to be very high, only 12 children out of 258 being free from them. These are, however, mainly pressure defects; also the child is lost if the pregnancy is allowed to go to term.

Mason (1940) also gives "symptoms of value" in the diagnosis of the condition.

- (I) There is usually a history of signs and symptoms of early ectopic pregnancy, with probable tubal abortion.
- (2) The uterus fails to continue to enlarge, or is mistaken for a fibroid or an ovarian cyst.
- (3 Vaginally, the cervix is abnormally high or very low, and is usually described as being like a non-pregnant cervix.

(4) The foetal movements are unusually

noticeable to the mother, and are often painful.

(5) The foetal heart is easily heard.

(6) There is frequently malaise and general disability which cannot be explained on the basis of the pregnancy alone.

(7) There is sometimes abdominal pain,

vomiting and haematemesis.

(8) X-rays are not usually very helpful unless the diagnosis is sufficiently certain to allow of lipiodol injection into the uterus.

(9) A false labour occurs and is followed

by cessation of foetal movements.

Mason surveys 69 cases in which there were 22 maternal deaths. He analyzed these carefully, and showed that few occurred when the placenta was left in situ with closure of the abdomen, rather than when it was removed, or the sac marsupialized or drained.

The special interest of the case here described lies in the following facts:

(I) The condition was diagnosed at an early period of the pregnancy, so that a series of radiographs was obtained. Owing, however, to the patient's obesity, these did not promise good reproduction and tracings have been substituted (Figs. I, 2, 3).

(2) The pregnancy was terminated before

term, i.e., at 38 weeks.

(3) The mother and baby are alive and the baby well formed, although there were transient pressure deformities at birth.

#### CASE HISTORY.

The patient was a primigravida, aged 32 years, married 6 years, with no history of illnesses beyond appendicitis for which she was operated on 14 years ago. This had left a very extensive scar.

She was first seen in this unit on 17th November, 1945. She was an obese, thick-set woman, complaining of pain and tenderness in the suprapubic area and right loin for several weeks. Her last monthly period was 1st September, 1945, expected date of delivery 8th June, 1946. She had been in another hospital about the 19th October with abdominal pain and frequency. Report from this 'hospital: "Urine normal. Cystoscopy—slight hyperaemia. The patient was reassured and no treatment was given."

Examination showed a markedly tender uterus, enlarged to about 2-3 months pregnancy. The temperature was 99.4°F. and pulse 110. The urine contained a faint trace of albumen, oxalate crystals and 3 pus cells per field; culture sterile. Intravenous pyelography showed slightly dilated ureters and renal pelves. A diagnosis of pyelitis and early pregnancy was made. The pregnancy was confirmed by the Aschheim-Zondek test, and the patient was discharged without pain 3 weeks later.

She was seen in December, when she was well, apart from slight abdominal pain on the right side. Period of amenorrhoea—3 months; height of pelvic swelling adjuged 4 months.

29th January, 1946. After attending her local clinic, she was sent to us for consultation with a diagnosis of pregnancy with a possible ovarian cyst. The height of the pelvic swelling was then about 24 weeks (amenorrhoea 20 weeks), the left side being higher than the right. Vaginal examination disclosed a small conical cervix with a thickening high up in the abdomen. Radiograph: "Breech presentation rather high; height of head L 2, but not thrown forwards, which would have occurred with an ovarian cyst" (Fig. 1). Accurate palpation was difficult, due to the thickness of the abdominal wall.

and March. Patient complained of occasional attacks of pain and vomiting.

The swelling had increased in size, particularly on the left side. X-rays showed a normal foetus in "splenic position" (Fig. 2). A tentative diagnosis of extrauterine pregnancy was made.

4th April. The patient was again admitted to hospital, complaining of recurrent attacks of vomiting, upper abdominal pain and haematemesis. She was very distressed and had marked acetonuria. She responded well to treatment (glucose drip, vitamin B<sub>1</sub>, sedatives). She had occasional attacks at later dates of vomiting, pain

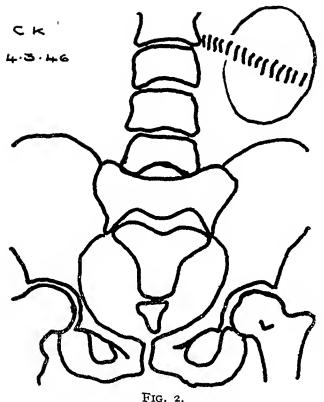


Tracing of Radiograph, 29th January, 1946.

and distension, with a particularly severe attack on 17th May, when her blood-pressure, which had been very gradually rising, reached 170/88. She remained in hospital until delivery.

Her abdomen was tense, the foetus palpable, with its head in left subcostal region and its heart heard in left flank, and there was vague thickening at the level of a 20 weeks pregnancy.

26th April, 1946. X-rays showed the foetus with head flexed forward on to the chest and with extended legs—still in "splenic position" (Fig. 3).



Tracing of Radiograph, 4th March, 1946

The diagnosis lay between:

- (1) Extra-uterine pregnancy.
- (2) Distorted growth of uterus due to adhesions to appendix scar.
- (3) Unicornuate uterus or other deformity with pregnancy.

On 4th May the patient was seen at 36 weeks in consultation with Mr. J. V. O'Sullivan, but the foetus appeared small, and so laparotomy was postponed for 3 weeks. It was undertaken on 19th May following a return of the vomiting with rising blood-pressure.

#### OPERATION.

Incision. Sub-umbilical mid-line, later extended through umbilicus. There was a layer of fat about 1½ inches thick in the abdominal wall.

On exposing the peritoneum, many mediumsized vessels were found coursing in an upward direction over a cystic mass, the whole suggesting that the bladder was reaching upwards as far as the umbilicus. The incision was extended, the urachus was exposed and the peritoneum opened. It was then found that the peritoneum was lightly adherent to the sac below. This was ruptured during the breaking down of adhesions near the umbilicus, in an area which was greenish and appeared meconium-stained. There was no fluid in the sac. The peritoneum, which was very thick, was further separated, the sac was opened and the baby delivered.

The child was a female weighing 8 pounds, and responded very quickly to treatment, although her. condition gave some anxiety for 2 days. She was lying as shown in the radiograph, that is, with the head in the lumbar region under the spleen and the legs extended. Although there was no bleeding on opening the sac, it was thick-walled, with many vessels which bled later.

The placenta was situated on the posterior wall of the abdomen, over an area reaching to the level of L 3, rather more to the left than to the right side. It shut off the pelvic cavity and organs, to which it appeared to be attached. It was felt that it was too dangerous to explore this region. Coils of gut were incorporated in the posterior wall of the sac. At the right side, part of the swelling appeared cystic, as though it were oedematous broad ligament.

After the delivery the sac was closed—the edges being inverted and the placenta and sac were left in situ. There was bleeding from some vessels during the closure. Blood was drained from the cord, which was shortened as much as possible.

The abdominal wall was then closed in layers.

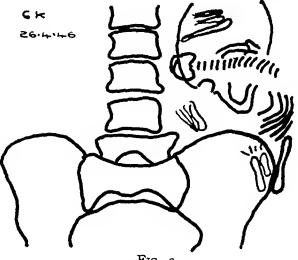


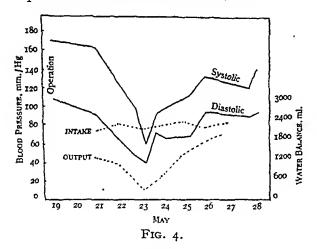
Fig. 3. Tracing of Radiograph, 26th April, 1946.

POSTOPERATIVE COURSE.

Immediately after operation the mother was put on a 5 per cent glucose-in-saline drip containing sulphathiazole. She was also given penicillin and anti-gas-gangrene serum.

For the first few days her condition was fair, but after 4 days she had a rigor in the early afternoon, her temperature rose to ro4°F. and her blood-pressure fell to 95/45. It fell further in the evening to 60/40, with great deterioration in her condition. The amount of urine passed in 24 hours was 15 ml. She was given, intravenously, plasma and sodium sulphate (4.28 per cent), and in an effort to raise a dangerously low blood-pressure, adrenaline was put into the solutions. The abdomen was distended and a glycerine enema gave a good result, but vomiting was very troublesome.

24th May. Her condition improved and the blood-pressure rose in the next few days to 130/90 with improvement in the water balance (Fig. 4).



These stormy few days appeared to cover a period of shock, probably arising from absorption of protein left in the abdominal cavity. For the next 2 weeks the patient remained very ill, although vomiting was controlled by about the 29th, after 10 days, and the drip treatment was stopped. A tense swelling became palpable in the abdomen about this time, and persisted for about a month; it was rounded, about 8 inches in diameter and was probably the distended sac.

On 5th June the patient passed a cast of the atterus; the expected date of delivery was 8th June.

The rest of her convalescence was complicated by the sloughing of a gangrenous area on the right leg, where an intravenous drip had been given, probably due to the action of adrenaline administered in the drip. This took many weeks to separate, and the area was finally treated with pinch skin grafts.

The patient was discharged on 29th September in good condition. Bimanual palpation of the uterus showed that it was still slightly bulky, and there was a mass felt high up on the right side.

#### THE INFANT.

As described above, a female child, weighing 8 pounds at birth, responded quickly to treatment and cried after 3-4 minutes.

For 2 days her condition caused some anxiety, as she had attacks of cyanosis. Her face was at first markedly assymetrical and she refused to use her legs. The muscles were lax, and the legs remained in extension, as they had been in the abdominal cavity. Massage was given, and the flexor muscles soon gained tone.

The baby was a bonny child when discharged in September.

March 1947. An attempt was made to do a hysterogram, but the right fornix of the vagina and the cervix were pulled up and distorted, and it was found impossible to insert a uterine catheter.

#### SUMMARY.

The case history is presented of an extrauterine pregnancy successfully treated by laparotomy at the 38th week.

It is of special interest as the condition was provisionally diagnosed at 6 months, and early radiographs are thus available.

Mother and baby survived.

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#### HYDATIDIFORM MOLE IN THE FALLOPIAN TUBE

BY

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Study of the literature suggests that hydatidiform mole in the Fallopian tube is an extreme rarity, and Pettit (1941) could list only 13 cases, to which she added I of her own. Nevertheless Teacher (1935) observes that hydatidiform degeneration is common in ectopic ova, and Hendry (1935) remarks that many reports have been published of hydatidiform mole in ectopic pregnancies. Meyer (1919) has made a truly monumental contribution to the literature of 48 cases of hydatidiform degeneration in tubal pregnancies, but Novak (1947) discussing this, suggests that the diagnosis in most cases was based on uncertain stromal and vascular changes which have not obtained general acceptance, and Pettit (1941) also appears to have ignored Meyer's claims in her study of the cases previously reported. There is considerable disagreement also as to the frequency of hydatidiform mole in ectopic pregnancy, and although Phaneuf (1937) states that hydatidiform degeneration occurs in 3 per cent of all cases of ectopic pregnancy he does not quote a single case, and in a series of o cases of hydatidiform mole which he describes all were uterine in situation. Sherman's (1935) series of 78 cases of hydatidiform mole included one tubal mole, and in a series of 57 cases described by Chesley, Cosgrove and Preece (1946) there is no mention of tubal hydatidiform mole. Fimarola (1947) in an exhaustive review of 436 cases of ectopic pregnancy makes no mention of hydatidiform degeneration. Meyer (1919)

states that the incidence of hydatidiform mole in 104 tubal pregnancies was 16.1 per cent but in a later communication from Mall and Meyer (1921) the figure of 34 per cent is quoted. Schumann (1936) points out that in theory hydatidiform mole in tubal pregnancy is fairly common, while Goodall on the other hand states that the condition is extremely rare. Novak (1947) agrees with Schumann that in theory the condition should occur fairly frequently, and indeed the tendency to hydatidiform change, particularly in an early transitional form, which has been noted in many abortions as well as in tubal pregnancy, as for example by Hertig and Edmonds (1940), suggests that the condition should be fairly common, but the fact remains that very few unexceptionable cases have been reported. A further interesting anomaly is that a considerable number of cases of primary chorionepithelioma of the Fallopian tube have been reported, and as chorionepithelioma is a relatively uncommon sequela of hydatidiform mole it would be reasonable to expect to find a large number of cases of tubal hydatidiform mole as precursors of the malignant chorionepitheliomata. Ewing (1940), however, mentions 12 cases of chorionepithelioma of the tube but does not refer to hydatidiform mole. Hendry (1935) observes that the placental development ir ectopic pregnancy differs from that in intrauterine pregnancy in that the villi tend to penetrate more deeply into the muscle layers and it may be, therefore, that there

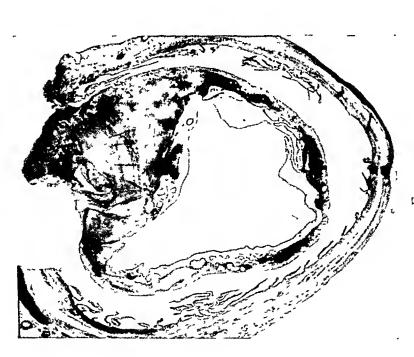


FIG. 1.
Section across the Fallopian tube showing the blastocyst aborted into the lumen. ×7.

J.A.C.



Hydatidiform villi with active proliferation of the trophoblast.  $\times 25$ .

is a greater tendency in cases where the ectopic ovum undergoes hydatidiform degeneration for the display of malignant characteristics and this may explain Pettit's observation (1941) that more than three times as many cases of chorionepithelioma as of hydatidiform mole of the Fallopian tube have been reported, if Meyer's series is excluded.

In an exhaustive survey of the literature up to 1919 Meyer was able to collect 8 cases, of which the earliest was that described by Otto in 1871. Two earlier cases described by Hennig (1876) as having been observed by Blasius, Meyer believes to have been tubal carneous moles and not hydatidiform moles.

Pettit (1941) states that the characteristics of hydatidiform mole which may be regarded as essential criteria for diagnosis are:

- (1) Trophoblastic proliferation.
- (2) Liquefaction and degeneration of the villous stroma.
- (3) Scantiness or absence of blood vessels.

Teacher points out that the epithelium tends to be very irregular, sometimes consisting of syncytium only, sometimes with the Langhans layer several layers thick and the syncytium drawn out into irregular bands and masses. Extreme vacuolation is to be observed in the cells. Portions of the mole may show villi with little cystic change.

King (1932), describing a case, pointed out that the trophoblast stained well, that the syncytial buds were active, and that the Langhans layer was active and not degenerate, as might have been expected had he been dealing with a carneous mole. He stresses the fact that in his patient the Aschheim-Zondek reaction was positive although the foetus was dead. In a tubal mole not of the hydatidiform type, King suggests that the reaction would probably

be negative, but this is not generally accepted, as a positive reaction may often be found both in uterine and ectopic pregnancy following the death of the embryo, as the result of continued production of gonadotrophin by the surviving chorion.

I have been unable to trace any report of a case more recent than that of Pettit (1941) and therefore regard mine as the 15th to be recorded.

#### CASE RECORD.

A married woman, aged 35 years, gave a history typical of an ectopic pregnancy, some 10 weeks' amenorrhoea followed by irregular bleeding, and low abdominal pain. An adnexal tumour was not palpable but symptoms were so characteristic that laparotomy was undertaken on 1st September, 1947. A very small amount of free blood was found in the pouch of Douglas. The left Fallopian tube was normal but the right contained a small swelling about 1 cm. thick and about 2.5 cm. long in the middle of the length of the right Fallopian tube. There was a minute rupture of the tube over this swelling and from this, watery blood-stained fluid was escaping. The pelvic organs were otherwise normal. The affected tube was removed and the patient made a good recovery. The Aschheim-Zondek reaction, carried out since, has been negative, and there is nothing on examination to suggest that there is any persistence of the mole or of any malignant degeneration.

The pathological report, for which I am indebted to Dr. H. J. R. Kirkpatrick, was as follows:

The Fallopian tube is dilated and has been cut open. A yellowish-red haematoma was found with a cyst-like cavity enclosed by it; no embryo was found.

Sections show that typical decidua and abnormal chorionic villi are present, many of the villi have undergone degeneration and swelling of the hydatidiform type. Diagnosis—Early tubal hydatidiform mole.

#### DISCUSSION.

Fig. 1 shows a low-power magnification of a cross section of the Fallopian tube where the blastocyst has been cut through and Fig. 2 a higher magnification showing hydatidiform villi which are grossly oedematous and quite avascular. In the centre of this figure is seen a mass of proliferating trophoblast.

In spite of the fact that chorionepithelioma occurs so much more frequently in cases of hydatidiform mole in the tube than in the uterus the prognosis in a case like this is, on the whole, better than in uterine hydatidiform mole, since the site of the mole has been removed completely and not left intact, as is usual in the case of the uterus.

#### SUMMARY.

- I. The literature relating to hydatidiform mole of the Fallopian tube is reviewed and a further case described. This brings the total number of cases recorded to 15.
- 2. The Aschheim-Zondek reaction is not of value in distinguishing between tubal pregnancy with a normal ovum, and that with a hydatidiform mole.
- 3. The treatment is that of any tubal pregnancy but careful follow-up with biological tests is demanded to exclude subsequent malignant degeneration.
- 4. The prognosis is good and better relatively than in uterine hydatidiform mole where the uterus is ordinarily left *in situ*.

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# ACUTE CRISES IN CHRONIC HAEMOLYTIC ANAEMIA INDUCED BY PREGNANCY

BY

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It is generally accepted that patients suffering from congenital or acquired haemolytic anaemia may remain free of clinical symptoms until some additional factor, such as excessive exercise, exposure to cold or intercurrent infection, brings about an acute haemolytic crisis. Little attention has so far been paid to pregnancy as a factor precipitating increased destruction of red cells in women suffering from chronic haemolytic anaemia, although it has been stated (Adair, 1940) that haemolytic crises are no more frequent in affected women during pregnancy than at other times.

The commonly employed term "haemolytic anaemia of pregnancy" (Vaughan, 1934) has not been clearly defined, since the cause of the anaemia described under this heading has not been sufficiently investigated to permit the drawing of definite conclusions. Many of these cases seem to have been macrocytic anaemias (Lescher, 1942), in which haemolysis is no more pronounced than in true pernicious anaemia. The favourable response to liver treatment reported in many such patients also argues against haemolysis as an important factor in the production of the anaemia.

However, cases of acute haemolytic

anaemia seem definitely to occur in pregnant women. Witts (1932), in his lecture on haemolytic anaemia, mentioned itsincidence during pregnancy, and supported the view that this disease is identical with acute haemolytic anaemia of the Lederer Lescher (1942) described 8 cases of acute haemolytic anaemia during pregnancy, with prompt recovery after delivery in all but I case. Furthermore, the unfavourable influence of pregnancy on chronic haemolytic conditions has recently been emphasized in some cases of sickle-cell anaemia (Kobak, Stein and Daro, 1941; Martinak, 1947) another condition associated with excessive haemolysis. In the medical literature available to us, we were unable to trace any case of chronic haemolytic anaemia in which crises were brought about by the occurrence of pregnancy.

The case reported below clearly illustrates the fact that pregnancy may precipitate a severe crisis of erythrocytic destruction in women with chronic haemolytic anaemia. Haemolytic episodes of extreme severity occurred during two successive pregnancies, and considerable improvement followed each delivery in this patient with chronic haemolytic anaemia of the acquired type.

A married woman, aged 27 years, born in Persia, was seen at the outpatient department on 5th January, 1942. She was then in the 7th month of her eighth pregnancy. She complained of pronounced anorexia, headache, backache, dizziness and a sensation of heaviness in the left hypochondrium. Her condition had deteriorated rapidly during the previous 2 weeks, during which period she had become increasingly pale, and her sclerae became moderately but distinctly jaundiced.

The patient reported that she had never previously suffered from severe anaemia. Her 7 previous pregnancies had run a normal course and had ended in normal deliveries, the last 3 having taken place in our hospital where anaemia had not been noted. Evidence of haemolytic anaemia could not be obtained of her parents, who had died at advanced ages, of undetermined causes. The patient's 7 children are all alive and healthy.

Examination on admission (15th January, 1942) revealed a well-developed woman. Despite her dark skin, a grey-yellow discoloration of the exposed parts was evident. The sclerae were yellow. The temperature was 99°F., pulse 110, and she was slightly dyspnoic; blood-pressure 160/110; slight oedema of the legs was observed. Examination of the abdomen revealed a 7-months' pregnant uterus with a living foetus. The spleen was firm and considerably enlarged, its lower pole was felt 4 centimetres below the costal margin. The liver was not enlarged. No change was noted in the ocular fundi. Laboratory tests gave the following results:

Urine analysis: traces of albumin; no bilirubin; urobilinogen, +++.

Hb.: 6.1 g. per 100 ml. of blood.

Erythrocytes: 1,820,000 per c.mm.

Haematocrit: 18.5 ml. per 100 ml.

M.C.V.: 102 cu. $\mu$ .

M.C.H.: 33γ.

Leucocytes: 5,200 per c.mm.

Differential leucocyte count (per cent): neutrophils 70, eosínophils 3, basophils 1, monocytes 3, lymphocytes 23.

Platelets: 220,000 per c.m. of blood.

Reticulocytes (per cent): 24.

Normoblasts, per 100 white-blood cells: 7.

Stained film: Anisocytosis, poikilocytosis, polychromatophilia are present and a certain degree of macrocytosis but no spherocytosis.

Fragility of erythrocytes in hypotonic salt solution (per cent): 0.48 to 0.34.

Serum bilirubin: 2.2 mg. per 100 ml.

Van den Bergh: direct: negative; indirect: positive.

Blood urea: 24.5 mg. per 100 ml. Blood uric acid: 4.3 mg. per 100 ml.

Plasma, total proteins: 6.43 g. per 100 ml.

Wassermann test: Negative.

Blood group: o(4).

An X-ray plate of the chest was normal.

This pregnant woman, then, was in an acute haemolytic crisis as shown by the severe anaemia, marked reticulocytosis, positive indirect Van den Bergh reaction and pronounced urobilinogenuria (see Table I). This haemolytic process was associated with signs of late toxaemia of pregnancy, manifested by the raised blood-pressure, oedema and slight albuminuria (see Table I). During the following weeks the blood-count did not deteriorate, but the anaemia and symptoms of toxaemia persisted, the latter in spite of rest in bed and a salt-free diet. The diuresis, however, remained at Taking into account the a satisfactory level. stationary condition of the patient and the special dangers associated with transfusion in cases of haemolytic anaemia (Sharp and Davis, 1938) particularly in pregnancy, this treatment was deferred unless an emergency should make it imperative.

On 14th March, 1942, after a short and uneventful labour, the patient delivered at term a living, normal girl, weighing 61/2 pounds (3,000 g.), and the child developed normally and is still in excellent health. The loss of blood during the 3rd stage of labour was very slight, not exceeding 150 ml. The puerperium was afebrile. Lactation was very poor. The signs of toxaemia disappeared rapidly. No albumin was present in the urine, and a normal blood-pressure was recorded at the end of the first week postpartum. The general condition of the patient improved as well, and on the 14th day after delivery laboratory findings showed a definite decrease of the haemolytic process (see Table I). The volume of the spleen was considerably reduced, but it still remained somewhat enlarged.

During the next 4 years, when the patient was examined regularly, haemolytic crises did not occur, although constant, increased blood-cell

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Data	<b>A</b>	B	၁	Ð	ਜੁ	Į.
Date	Admission 1942, 7th month, 8th pregnancy	14 days postpartum	Interval	Admission 1946 7th month, 9th pregnancy	2 months post-partum	Interval Interval 9 months post-partum
Erythrocytes	1,820,000	2,590,000	000	1,510,000	3,200,000	3,500,000
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Hb. g	1.81	2.5	ان ا	. 4I	25, 7	1
MCV cn	102	6	1	95	81	1
MCH	33	31	1	32	28	
Leucocytes	5,200	5,600		3,300	4,200	3,200
Differential count:	Č			8		
Neutrophiis	0/.			I mvelocyte		
Fosinonhils	rr			Н		
Basophils	o ⊷					
Monocytes	3					
Lymphocytes	23	ļ	ļ	10	ď	ď
Reticulocytes	24	12	0-10	20	4·5	Ď.
Normoblasts per	7			o		
Platelets. c.mm	220,000			250,000	280,000	
Fragility of red cells	0.48 to 0.34	0.48 to 0.34		0.48 to 0.34	0.46 to 0.30	
Serum bilirubin, mg.	2.2	1.4		4.6	1.2	
Van den Bergh	indirect (+)	indirect $(\pm)$		indirect $(++)$	indirect (-)	indirecț
Total protein per	6.43			5.1 A3.05	6.7 \ A4.2	
Blood urea per				(0.25)	(22)	
roo ml	24.5			21		
Blood uric acid,						
mg, per 100 ml.	4.3			5.4	4.1	
mg ner roo ml					下122年57	
Blood group	0			ORh.		
Urine Albumen	+1	0	0	1.5 g./ 1,000 ml.	0	
Urobilinogen	+ + +	+	+	++++	! +	
Urobilinogen excre-				11		
tion (quant)				Urine: 17 mg.	2.7 mg.	
Blood pressure	011/091	00/001	0 1 0 2 2	r acces: 1,152 mg.	400 mg.	
Pallor	017 /00T	0//021	110/76	145/90	115/05	-
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	Poikilocytosis		1			,
t ,1	Polychromatophilia			A.P.P. +	$A+P \pm P O$	

destruction was present as indicated by a red-cell count of 3 to 3.5 millions; haemoglobin 7.5 to 9 g. per 100 ml., and a reticulocyte count of 6 to 10 per cent. A certain degree of urobilinogenuria (1+) also persisted, as can be seen in Table I. The spleen could be felt one or two finger breadths below the costal margin. The liver also became slightly enlarged. It is noteworthy that no haemolytic crisis was elicited by a severe infection of the upper respiratory tract in the winter of 1943.

When examined on 15th August, 1946, the patient was found to be in the 3rd month of pregnancy. She complained of increasing weakness and dizziness, but no exacerbation of the haemolytic process was noted. These manifestations were referred to excessive vomiting from which the patient had been suffering from the beginning of the pregnancy. Mild symptoms of toxaemia set in in the 23rd week of The blood-pressure was 160/100 mm. Hg, the legs were oedematous and traces of albumin were found in the urine. The patient was advised to rest in bed and was put on a salt-free diet. Two weeks later she experienced dizziness, abdominal distress, headache and dyspnoea, and she fainted repeatedly while resting in bed. She also noticed that her skin had become increasingly pale and jaundiced, while her urine was very dark; and she herself compared her present condition to that experienced in her last pregnancy. When she was admitted to hospital physical examination of this 7-months' pregnant woman revealed extreme pallor and slight jaundice. The spleen was firm and extended a full handsbreadth below the costal margin, while the liver was felt 4 fingerbreadths below the right costal margin. The blood-pressure was 145/90 mm. Hg, pulse 108, temperature 100.4 °F., and the woman was dyspnoic. Distinct oedema of both legs, face and abdomen was observed. Examination of the ocular fundi revealed severe hypertensive changes, constriction of the retinal arteries and arterio-venous compression. An extensive recent haemorrhage was noted in the nasal region of the right fundus near the macula. Laboratory tests again gave evidence of intense haemolysis comparable to that observed during the previous pregnancy (see Table I, d). An X-ray film of the gall-bladder revealed no concrements, and the skull was radiologically normál. Marked erythroblastic activitity with numerous mitotic figures was observed in sternal marrow obtained by aspiration.

In view of the extreme severity of this haemolytic crisis which was the second occurring in the course of two successive pregnancies, it was decided to deliver the patient as early as possible. The early termination of the pregnancy seemed still more imperative in view of the serious toxaemia complicated by retinal haemorrhage. Owing to the poor general condition of the patient, blood transfusion was decided on in preparation for the induction of labour. Notwithstanding the fact that the blood selected for transfusion was of the same group (ORh,) as that of the patient, the transfusion had to be interrupted after the administration of the first 100 ml. because of a severe rigor followed by great distress and fever 104°F. (40.2°C.). During the following 3 days, the condition of the patient showed no improvement. The haemoglobin value and the red-cell count continued to fall (4.5 g. per 100 ml. of blood; 1,300,000 red cells per c.mm. of blood). Another transfusion was given, and this was followed by an even more severe reaction, characterized by rigors, high fever 106°F. (41.0°C.) and a diffuse scarlatiniform rash. No improvement of the haemolytic process was observed during the following days, but the appearance of more retinal haemorrhage prompted us to induce delivery by the insertion of a hydrostatic bag.

On 12th January, 1947, after a short labour, the patient delivered a living female child weighing 41/4 pounds (1,900 g.) which died 2 days later of bilateral bronchopneumonia, the diagnosis being confirmed at autopsy. The blood group of the child was ORh,, the same as that of the mother. A minimal amount of blood was lost by the patient during the 3rd stage of labour. The course of the puerperium was uneventful. The symptoms of toxaemia disappeared promptly, and repeated blood counts revealed rapid improvement. The haemolytic crisis subsided. The red-cell count and the haemoglobin value increased, while the percentage of reticulocytes and the excretion of urobilinogen decreased. The splenomegaly diminished rapidly and the hepatomegaly had completely subsided 2 months after delivery (see Table I, e).

#### COMMENT.

This case of chronic haemolytic anaemia, recognized first in a haemolytic crisis occur-

ring during pregnancy, presents certain interesting features. The two haemolytic episodes occurred during the patient's 8th and 9th pregnancies. Both of these episodes were associated with toxaemia of pregnancy, which in the second instance was so severe as to make induction of labour before term imperative. There was also evidence of some degree of persistent haemolysis in the interval between the 2 pregnancies under survey as well as after termination of the latter, and the increased red-cell destruction has persisted to date, as shown by all available laboratory tests.

The question arises whether this woman is suffering from haemolytic anaemia of a congenital or of an acquired type. It is generally acknowledged that a diagnosis of the congenital type requires the presence of particular features, such as a familial occurrence of the disease, increased fragility of the red cells and spherical microcytosis. Our patient had neither a positive family history nor a history of haemolytic episodes prior to the 8th pregnancy. Furthermore, laboratory findings failed to reveal either increased fragility of the red cells or the presence of spherical microcytosis. In none of the members of the family available for examination (2 brothers and 7 children), were splenomegaly, anaemia, spherocytosis or reticulocytosis observed, and their erythrocytes had a normal fragility when tested against hypotonic saline solutions. These negative findings support the diagnosis of haemolytic anaemia of the acquired type.

In this case pregnancy seems to have exerted a definite influence on the course of the disease by eliciting haemolytic crises in 2 successive gestations, and the crises were relieved by delivery in both instances. It has been mentioned that other factors known to precipitate haemolytic crises, such as intercurrent infections, did not influence the course of the disease in our patient. It is also of particular interest that both the gestations which exerted such an unfavourable influence on the course of the chronic haemolytic anaemia were associated with toxaemia of pregnancy.

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#### **BOOK REVIEWS**

"The Care of the Teeth: Pre-natal and in Infancy." by G. HERBERT H. RUSSELL, M.B., Ch.B., L.D.S. (Eng.).

Pp. 48. John Sherratt & Son, Altrincham, 1948. Price 2s.

This little book sets out to guide the expectant and nursing mother in the care of her own and her baby's teeth. With this purpose in view it fills a definite need.

The importance of healthy teeth, diet and prenatal care generally, is discussed with particular reference to the developing teeth of the unborn child. The beneficial effect of breast feeding on the growth of the bones of the face is stressed, and also the giving of dry food as a stimulus to mastication. The approximate dates of eruption of the various teeth are given, and an account of teething troubles. Finally, there is a chapter on the care of the child's teeth.

There are a few rather obvious omissions, such as the question of thumb-sucking, dummies and sweets. A chart of the teeth would have been helpful in the section on eruption. There is a rather misleading passage on hypoplasia of the enamel due to early measles, etc., which seems to infer that in some way this could be prevented. The teaching of a child to massage its gums would be regarded by many as unnecessary and undesignable. On the other hand, the idea of a T-shaped tooth-brush for the use of the very young seems a good one.

The style of writing is intended to be informal, which probably accounts for some rather careless grammar and punctuation. The repeated use of the word "babe" however might well prove irritating

expect an authoritative account of the pathology of tumours in this new work. They will not be disappointed. The present work covers the whole field of tumour pathology in as much detail as is possible in 990 pages. The first 200 pages are devoted to a consideration of the general pathology of tumours. After defining the term tumour and drawing up his own classification, which is followed in the second part of the book, Willis gives an excellent account of the experimental production of tumours, in which he stresses strongly the importance of chemical carcinogens. This is followed by a critical study of cancer statistics, in which he throws considerable doubt on the accuracy of many published figures. The chapter on spontaneous tumours in animals is interesting and valuable in giving one a broader viewpoint of human tumours. In the chapter on the mode of origin of tumours, Willis strongly denies the older view of unicentric origin and puts forward the view that cancer originates at a number of points in a potentially malignant field. The following chapters on the spread and behaviour of tumours recapitulate the views expressed in his earlier book. The final chapter of part I is devoted to a good clear summary of the nature of neoplasia.

The next 400 pages are devoted to epithelial tumours and Willis discusses these under their various organs of origin, taking benign and malignant tumours together in each organ. The remaining 400 pages are devoted to mesenchymal, nervous and other tumours, again dealing with each group under its tissue of origin. Taking together each group of simple and malignant tumours, Willis stresses the view that innocence and malignancy are but extremes with many gradations between them. Whilst pathologists will heartily agree with this, they still have to try and assess the probable behaviour of the individual tumours they examine and some will wish that this book gave more information on this point.

The individual chapters give good, considered and up-to-date accounts. Most of them express

<sup>&</sup>quot;Pathology of Tumours." By R. A. WILLIS.
Pp. 991. 500 illustrations. Butterworth & Co.,
Ltd., London. 1948. Price 63s.

Professor R. A. Willis is already well known for his many contributions to the study of tumours, and those who have read his earlier works will

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clearly the generally agreed modern view, others are less orthodox, but often in reading the less orthodox we felt that Willis had had the courage to put into words suspicions which had lain unexpressed in our own minds.

It is not within the scope of a review to discuss the chapters in detail, but some at least demand mention. Breast is well done, though many will not agree with the views on Paget's disease. chapter on epidermoid tumours is clear and brings together in a simple way the many odd tumours of skin. The chapter on tumours of dental origin is a model of clarity. The chapter on tumours of ovary is clear and straightforward, but will shock the lovers of esoteric hypotheses. The other chapters on gynaecological tumours are clear and up-to-date. The introductory chapter on mesenchymal tumours stresses the multiple potentialities of mesenchyme, and consequently of the tumours derived from it, and thus explains many tumours which would be anomalous to those who believe that cells are immutably fixed in their line of differentiation.

In the preface Willis states "I also wished the book to be a personal record of my own observations and conclusions. . . . On controversial matters, too, while indicating that they are controversial, I have preferred to avoid non-committal vagueness and to state plainly my own present opinions, even though these may have to be modified in the light of future experience." He has adhered to this plan courageously throughout the book, stating his opinions dogmatically even when they are at variance with those of other workers; though it is only fair to say that he is careful to give fully his reasons for the views he holds. Throughout the book Willis writes of what he has seen and studied, and quotes freely from his own cases, giving brief clinical histories. Those subjects which he had studied most are particularly good; Teratomata, Retinoblastomata, Neuroblastomata and testicular tumours being outstanding.

In many cases his views will certainly meet with

criticism: the view that lymphatic leukaemia, the reticuloses and lymphosarcoma are all variants of one disease, that monocytic leukaemia is not a separate entity, that Ewing's tumour does not exist as a separate primary tumour, to mention only some.

Willis has no use for complex subdivisions and esoteric hypotheses and one must be prepared to have one's favourite theories criticized without mercy, and to see the more complex classifications compressed into a few broad groups. Because of this iconoclastic attitude this is a stimulating book to read: there is hardly a chapter in which one does not see a fresh viewpoint—even at the cost of a cherished illusion.

The book is illustrated with 500 microphotographs. There are no illustrations of gross specimens and the microphotographs are nearly all of low-power magnification—the most useful type in our opinion. They are mostly very good, but Fig. 371 is a sad exception. The style is clear and eminently readable. There is a good index and type errors are few.

In future editions one would like to see page as well as figure references, particularly when the figure is far from the text. A chapter on the response of tumours to irradiation would be a valuable addition. The statement that non-neoplastic squamous metaplasia of the bronchus is rare certainly does not accord with our experience. The frequency of skin metastases in bronchial carcinoma might have been mentioned, and we would have preferred carcinoma of bronchus rather than lung. The leuco-erythroblastic response in bone-marrow metastases should have been more clearly stated. In discussing primary carcinoma of liver and its relation to cirrhosis, mention might have been made of Himsworth's work.

These are perhaps carping criticisms of a book which, taken as a whole, deserves the highest praise. It is a worthy successor to Willis's earlier work, and is a book which should not merely be bought but should be read by any one interested in tumours.

#### REPORTS OF SOCIETIES

### NORTH OF ENGLAND OBSTETRICAL AND GYNAECOLOGICAL SOCIETY

January, 1948

The annual meeting was held in the Department of Obstetrics and Gynaecology, Manchester, on 2nd January, 1948.

The President, Mr. J. E. Stacy, was in the Chair.

Dr. Scott Russell (Manchester) described:

THE REPAIR OF A VESICO-VAGINAL FISTULA FOLLOWING RADIUM TREATMENT FOR CARCINOMA OF THE CERVIX.

Having paid tribute to the work of Professor Chassar Moir at Oxford, he said that he followed the same technique which was based on the original method of Sims. The principles to be followed in the treatment of fistulae were: (i) thorough examination of the patient, (ii) good exposure, (iii) saucerising the edge of the fistula, (iv) removal of scar tissue, (v) usually no separation of bladder from vagina, (vi) use of silver wire or other inert suture material, (vii) closure in one layer without tension, making relief incisions if necessary, (viii) continuous bladder drainage by a catheter so placed through the urethra or through a cystotomy incision that it did not put pressure on the suture line. In dealing with fistulae following radiotherapy the great problem was the fact that the tissues were all avascular-indeed, ischaemia was usually the cause of late fistulae. Other difficulties were fixation and fibrosis and the proximity of the ureters. It was essential in the operation to use tissues with a blood supply sufficiently good to ensure healing, and this often meant closure of the vagina well below the level of the fistula.

Dr. Scott Russell went on to describe a case in which a fistula developed some 18 months after

radiotherapy. He outlined the steps of his operative treatment in which a 1/2 inch wide cuff of the vagina well below the fistula was denuded of epithelium and then sutured antero-posteriorly with interrupted sutures of silver wire. Continuous bladder drainage for ten days was followed by continence, but there was partial breakdown of the vaginal septum when the sutures were removed. After further bladder drainage, however, only a tiny hole remained, and the patient 4 months after operation was passing urine per urethram, and suffered only slight and occasional leakage of urine through the vagina. Dr. Scott Russell considered that had he carried out colpocleisis at an even lower level where the blood supply would have been better, and if a wider cuff of vagina had been removed, healing would have been more satisfactory.

The President congratulated Dr. Russell on the result of this operation and emphasized the difficulties of treating post-radiation fistulae. He suggested that transplantation of the ureters would still be regarded as preferable by some surgeons. Mr. K. V. Bailey and Mr. Racker also congratulated Dr. Scott Russell, and the latter asked what procedure should be adopted where a patient developed both a vesical and a rectal fistula. In reply, Dr. Scott Russell said that this combination, although it presented difficulties, could be dealt with surgically and mentioned seeing one case in which the steps in treatment had been: (i) colostomy, (ii) closure of recto-vaginal fistula, (iii) closure of vesica-vagina fistula by partial colpocleisis, (iv) closure of colostomy.

Mr. D. C. Racker (Manchester) showed a specimen of:

A Large Fibro-Myxoma of the Vulva.

The patient, aged 42, had had 2 children and 2 abortions, and complained of a large, soft and diffuse swelling of the left labium majus; this had been incised on 2 occasions during the previous 8

years. It was clearly not a Bartholin cyst but it was difficult to make a definite diagnosis preoperatively. After making an incision a lobulated soft and pinkish tumour presented and was then found not only to occupy the whole of the left labium, but to extend high into the ischio-rectal fossa on that side. The possibility of a perineal hernia was kept in mind and much time was spent in looking for a peritoneal pouch. None was found, and the tumour, the size of a melon, was dissected out complete, the patient making a good recovery.

The specimen, containing small cystic spaces, was shown to members and also microscopic sections. The latter showed the tumour to consist of stellate cells in a fibro-myxomatous matrix with no evidence of malignancy. The President said that although fibromata of the vulva were not uncommon, he had never seen a case of the type described.

Mr. John Hadley (Lincoln) read a paper on:

TORSION OF HYDROSALPINX IN PREGNANCY.

This was based on the case of Mrs. N. K., aged 23, admitted as an emergency to Lincoln County Hospital on 17th June, 1947. She was about 4 months pregnant (L.M.P. 3rd February, 1947) and complained of generalised abdominal pain, accompanied by nausea and some vomiting, which she had had for 4 days. On admission the pain was rather easier and was localised mainly to the left iliac fossa. There had not been any bowel action during the previous three days. Temperature and pulse rate were normal. Investigations were carried out with the possibility of a large bowel obstruction in mind. On examination the only positive finding was slight abdominal distension and the presence of uterine enlargement corresponding to a 4 months' pregnancy; this latter was lying a little to the right of the middle line. X-rays of the abdomen and spine did not show any significant abnormality, but there was some shadowing of the base of the right lung which raised the possibility of tuberculosis. There was slight leucocytosis (15,000 per c.mm.); the blood sedimentation rate was 15 mm. in one hour; the urine contained a moderate number of pus cells but was sterile on culture.

By 3rd June it was possible to feel a fluctuant tumour in the left iliac fossa, the uterus being displaced to the right. This tumour became more clearly defined during the next 2 days, so it was decided to carry out laparotomy.

26th June, 1947. Operation. Left paramedian incision. Uterus 4 to 5 months in size. A black "cyst-like" mass was found in the left iliac fossa adherent to the pelvic wall and to the colon and arising in association with the Fallopian tube. Left ovary normal. Right Fallopian tube and ovary normal. Left salpingectomy performed. The tube had undergone 1½-2 twists. The adhesions to colon and peritoneum appeared to be recent and to be due to mild inflammatory changes subsequent to twisting. The cyst-like mass was about 4 inches in diameter and, after removal, was found to consist of a grossly dilated tube, thin walled and full of blood-stained fluid and a little clot. There was no evidence of tubal pregnancy.

Recovery was uneventful and the patient was discharged on 8th July. Pregnancy continued and delivery took place normally on 20th October of a full-time child,  $6\frac{1}{2}$  lbs.

Mr. Hadley concluded that the condition was one of torsion of a hydrosalpinx occurring in pregnancy and not involving the ovary. Review of the literature suggested that this condition is rare. The latest comprehensive article was by Eastman in 1927 and he gave 55 references to articles on torsion of the tube (normal or pathological), most of them unassociated with pregnancy. He described 3 cases observed by himself, one of which occurred during pregnancy. The first case of torsion of a Fallopian tube was described in 1891 when Bland Sutton reported one operated on by Henry Morris. This report was followed by one by Delbet, who noted the similarity in appearance to that of strangulated bowel. Praeger of Germany and Cathelin of France made collective studies in 1899 and 1900 of 35 authentic cases. Anspach of U.S.A. in 1912 brought the number up to 62, Eastman (1927) up to 91. Since 1912 torsion of normal Fallopian tubes has been reported and supported on the ground that many cases are seen in girls of puberty age in whom an existing hydrosalpinx would seem unlikely. Moreover at operation no adhesions or other evidence of antecedent pathological changes are found.

Anspach held that the Fallopian tube is the seat of a hydrosalpinx which is converted into a haematosalpinx after torsion. It may occur in virgins and others who give no history of pelvic inflammation:

- (a) as a sequela of vulvovaginitis in childhood which persists in latent form until puberty and then produces involvement of the Fallopian tube,
- (b) as a late result of an unrecognised salpingitis occurring in one of the exanthemata,
- (c) as a result of attenuated tuberculous infection.

Mr. Hadley concluded by reference to the symptoms and signs of the condition and pointed out that it had to be differentiated from (a) obstruction of the bowel, (b) torsion of ovarian cyst, (c) ectopic pregnancy, (d) appendicitis, (e) renal conditions, (f) cold abscess.

The President said he had had experience of one case of torsion of the Fallopian tube and he questioned whether hydrosalpinx was always the result of infection. He also pointed out the difficulty in diagnosing hydrosalpinx. Dr. A. A. Gemmell said he had seen 3 cases of torsion of the Fallopian tube occurring in non-pregnant women. Mr. C. H. Walsh recalled that he had previously described to the Society a case of torsion of the Fallopian tube during pregnancy. Professor T. N. A. Jeffcoate said he thought that torsion of the normal Fallopian tube or of a hydrosalpinx was not so uncommon as the literature indicated, and he knew of 4 cases (including 2 of Dr. Gemmell's 3) which had not been recorded. With regard to the diagnosis of uncomplicated hydrosalpinx he pointed out that hysterosalpingography sometimes revealed the condition and also indicated that in some of these cases the inner end of the Fallopian tube was patent. It was difficult to understand how a hydrosalpinx developed when one end of the Fallopian tube was patent.

In his reply Mr. Hadley said that in his case the large size of the tumour made him think that the Fallopian tube was already the seat of a hydrosalpinx before the torsion took place.

The second meeting was held in Manchester, on 6th February, 1948.

The President, Mr. J. E. Stacy, was in the Chair. Dr. S. Bender (Liverpool) described:

A CASE OF TUBERCULOSIS OF THE CERVIX

WEIGH MACROSCOPICALLY RESEMBLED

MA OF THE CERVIX.

The Patient, a null story until 1944. After 7

months' amenorrhoea in that year, dilatation and curettage had been carried out in another hospital and had been followed by 2 normal periods. Her present complaint was of amenorrhoea and a brown vaginal discharge, both of 18 months' duration. She also gave a history of an attack of haematuria 2 months previously. The cervix was seen to be the seat of a hypertrophic growth which bled on being touched and which looked typically malignant, but, in view of the patient's age, the history of amenorrhoea and of haematuria, and the suspicion of swellings of the appendages, a provisional diagnosis of tuberculosis was made. This was confirmed by biopsy of the endometrium and of the cervix. In the absence of evidence of urinary or other extragenital tuberculosis, the whole of the uterus and both appendages, which were the seat of caseous tubo-ovarian abscesses, were removed. One abscess burst during the operation and a sinus persisted in the abdominal wound for 5 months before closing after a course of small doses of deep X-ray therapy. Otherwise the patient made a good recovery. Although a diagnosis of tuberculous endometritis had been made in 1944 the patient had not been informed or treated, and the condition had evidently progressed to involve the cervix. Photographs of the cervix taken before operation, and the specimen itself, were shown.

Dr. Bender then briefly reviewed the respective claims and merits of conservative and radical treatment of genital tuberculosis, and emphasized the value of X-ray therapy as an auxiliary form of treatment, although its exact mode of action was not known.

The President said that genital tuberculosis is more common than is generally supposed and pointed out that since some cases showed a positive Aschheim-Zondek reaction a diagnosis of pregnancy might be made in error. He thought that when the condition was symptomless operative treatment was not usually indicated. Dr. Blomfield (Sheffield) said that deep X-ray therapy was of some value but not for extensive lesions. Professor Jeffcoate (Liverpool) agreed that genital tuberculosis is comparatively common, and was of the opinion that when it was reasonably certain that there was no other active lesion in the body, there was much to be said for surgical treatment even though this might mean hysterectomy. He thought that the dangers and difficulties of surgical treatment had

been exaggerated and, of 21 patients treated by some form of abdominal operation during the previous 5 years, only one had developed a troublesome sinus in the abdominal wall-and that because the abdomen had been drained in error. the diagnosis not being made at the time of operation. Dr. S. B. Herd (Liverpool) also thought that radical treatment was indicated in many cases, while Mr. N. L. Edwards (Derby) pointed out that, if hysterectomy were carried out, at least one ovary should be conserved. Dr. Bride (Manchester) referred to a case of cervical tuberculosis in which the patient's husband had tuberculous epididymitis. Dr. Newton (Manchester) emphasized the difficulty of deciding whether to operate in quiet cases of genital tuberculosis. Professor Dougal (Manchester) was generally in favour of surgical treatment, and so was Mr. C. Walsh (Liverpool). Dr Bender replied.

Dr. A. A. Gemmell (Liverpool) described:

#### A CASE OF FIBROID IN THE CERVICAL STUMP AFTER SUBTOTAL HYSTERECTOMY.

A married woman, at the age of 31 years, had a subtotal hysterectomy with removal of both appendages for pelvic infection, and it was noted at the time that there was difficulty in freeing the appendages. She was seen again 6 years later when she had a brisk vaginal haemorrhage which lasted for 24 hours, and a profuse discharge. There was a solid tumour extending from the pubes upwards to the umbilicus and lying somewhat obliquely in the abdomen, reaching to a higher level on the right. It was attached to the cervix and this structure was displaced upwards and to the right.

Operation was undertaken on 19th July, 1933. An attempt was first made to use a cystoscope which passed upwards and to the right, but even when the bladder was filled under pressure no view could be obtained. The abdomen was opened in the midline and, as the bladder was found to be lifted up to within 2 inches of the umbilicus, the incision was enlarged upwards beyond that point. Exploration showed that the condition was a cervical fibroid. A false plane of separation was opened downwards towards the left fornix, and this gave considerable trouble with bleeding during the remainder of the operation. The true capsule of the fibroid was then found and the tumour was

enucleated without difficulty. To reduce the risk of damage to other structures no attempt was made to obliterate the sacs, but they were tightly packed with gauze. The patient had an afebrile convalescence and left hospital on the 20th day with her wounds well healed. The specimen weighed o pounds and on section was a typical fibroid showing both interstitial and lacunar oedema.

Dr. Gemmell went on to mention that a similar case had been described to the North of England Society by Sir William Fletcher Shaw in 1923, and that Professor Dougal had mentioned a second case during the discussion at that time. Another 4 cases had been found reported in the literature. He emphasized that it is a rare condition and that with a personal experience of 800 subtotal hysterectomies he had never previously encountered it. In 3 of the cases reported at least one ovary had been conserved at the time of the original operation, in 2 others some ovarian tissue may have been left in inflammatory adhesions, while in the remaining 2 nothing was recorded as to the procedure adopted regarding the ovaries. Dr. Gemmell suggested that residual ovarian activity might favour the subsequent development of fibroids in the cervical stump and went on to comment on the fact that these tumours appear to reach a large size in a relatively short time-possibly because of early degenerative changes consequent upon poor bloodsupply.

The President agreed that conservation of the ovaries might increase the chance of the development of fibroids in the remaining portion of cervix, but Mr. N. L. Edwards (Derby) hoped that this remote possibility would not result in fewer ovaries being conserved; he also gave an account of a case which he had treated. Sir William Fletcher Shaw (Manchester) recalled his case previously recorded, and said that after removal of the cervical fibroid, which proved a most difficult operation, the patient developed a further tumour in the cervix which, so far as he knew, was never treated surgically. He said that it seemed possible that some of these cervical fibroids were sarcomata of low-grade malignancy and this would also account for their rapid growth. Professor Dougal (Manchester) referred to his case, and Dr. R. M. Corbet (Preston) mentioned having seen a patient develop uterine fibroids 20 years after bilateral oöphorectomy. Dr. A. A. Gemmell replied.

Professor D. Dougal (Manchester) described:

A CASE OF CARCINOMA OF THE BODY OF THE UTERUS AND FIBROID TREATED WITH RADIUM AND SUBSEQUENTLY BY HYSTERECTOMY.

A married woman aged 60 years, 8 years postmenopausal, had had 3 three children and 2 miscarriages. She was seen in December 1942 complaining of "terrible bearing down pain" and a watery discharge with intermittent uterine bleeding. Four months previously a diagnosis of carcinoma corporis uteri had been made, and she had been treated by 3 applications of radium. Although she had lost 2 stones in weight in the previous 2 months her general condition was fairly good. The uterus was enlarged by fibroids extending almost as high as the umbilicus and, together with the appendages, was totally removed. Both ovaries had innocent warty growths on their surfaces and the uterus, in addition to fibroids, contained a large necrotic and stinking growth in its cavity. After making a good recovery the patient reported again 4 months later complaining of severe rectal tenesmus due to a late radium reaction. Pre-sacral neurectomy was carried out. Two years later she was still well except that the rectum was ulcerated, and in 1947 (5 years after the hysterectomy) she was seen again and was free from any sign of growth. She was, however, still using a morphia suppository each night-having developed this habit when the rectum was ulcerated.

Professor Dougal concluded by expressing the view that this patient should have been treated surgically in the first place. He showed sections of the uterus which revealed obvious adenocarcinoma present in spite of the radium, although there were some areas of necrosis.

The President asked what radium technique was employed and suggested that such a severe rectal reaction might mean that some of the radium was inserted into the vagina, or had slipped out of the uterine cavity. Dr. Blomfield (Sheffield) agreed that this type of case was not suitable for radiotherapy and said that the areas of necrosis were not due to the radium but represented the usual degenerative changes found in all extensive malignant growths. Mr. N. L. Edwards (Derby) discussed the severe pain which was a prominent symptom in this case, expressing the view that it was due

to expulsive uterine contractions rather than the heavy infection. Professor Dougal replied, pointing out that carcinoma of the body of the uterus could be present for many years and yet still remain amenable to surgical treatment.

Mr. K. V. Bailey (Manchester) read a note on:

THIRD STAGE AND POSTPARTUM UTERINE CONTROL.

He reviewed the present day views on the "control" or "guarding" of the fundus during the third stage of labour and went on to point out its dangers. He emphasized that it nearly always means that the attendant is tempted to carry out massage of the fundus and to attempt early expression of the placenta. He considered that handling of the fundus as usually carried out, with resulting pressure on the sensitive cornua and adjacent ovaries, was conducive to shock. In general he thought there was little need to take active steps in the third stage, but when these became necessary he had found one method of stimulating the uterus which was efficient and free from risk. In this, the ulnar surface of the whole hand was placed across the uterus just above the pubes, and was then stroked upwards to stretch the lower segment. On reaching the fundus the hand was passed over and behind, and the posterior surface of the uterus was then stroked upwards to stretch the posterior aspect of the lower segment. The manoeuvre stimulates powerful contraction of the upper and lower segments, and the latter is important. It can be combined with the wellknown supra-pubic test for descent of the placenta from the upper to lower segment.

The same speaker then read a note on:

AN ADDITIONAL METHOD OF INFANT RESUSCITATION.

He mentioned the standard methods of resuscitating a baby born in a state of asphyxia, and emphasized the dangers of each. Without wishing to put it forward as a method to be used in all cases, but one which was suitable and effective in some, he described a manoeuvre which can be carried out as soon as the baby is born and before the placenta is divided. The baby is laid face down-

wards on the palm of the obstetrician's left hand. The head naturally hangs downwards in an attitude of flexion, and drainage of the upper air passages is thus assured. The child is then repeatedly thrown upwards about ¾ to 1 inch from the hand, each time settling back into the same position. During the upward movement the chest expands, as in inspiration; the expiratory movement is assured by the counter pressure as the child comes to lie on the obstetrician's hand again. This manoeuvre is carried out at regular intervals as in artificial respiration. To avoid any chance of the baby falling, one leg can be steadied by the operator's right hand.

Dr. Bailey then showed a film illustrating both the manoeuvre for stimulating the uterus in the third stage of labour and afterwards, and the method for resuscitating the baby. The President said he thought the advantages of this method of resuscitation lay mainly in the fact that it ensured clearance of the air passages. In regard to this he never used a mucus catheter, but depended always on holding the child in the right position. For bleeding after the third stage of labour he thought lifting the uterus high in the abdomen, thus putting tension on the lower segment, was a most efficient stimulant of uterine retraction. Dr. R. M. Corbet (Preston) emphasized that any method of management of the third stage of labour or of postpartum haemorrhage should be preceded by emptying the bladder; he agreed that upward traction on the lower segment was valuable in the control of bleeding, but he thought that Dr. Bailey's method of resuscitating the newborn was liable to produce injuries such as fracture, dislocation of the cervical spine. Dr. Dickson believed that the administration of oxytocics in the third stage of labour was a procedure to be commended, while Dr. Newton (Manchester) re-affirmed his belief that in the absence of haemorrhage there was no harm in leaving the placenta in the uterus for an indefinite period of time. Mr. C. M. Marshall (Liverpool) suggested that the Society might profitably set aside a whole meeting for a discussion on the management of the third stage of labour and postpartum haemorrhage. Mr. K. V. Bailey replied, stressing that he did not wish to put forward his methods as ones for universal or routine application, but rather to bring to the notice of the Society additional methods which are useful in some cases.

ROYAL SOCIETY OF MEDICINE

Section of Obstetrics and Gynaecology.

President: A. J. McNair, F.R.C.S.

Meeting on Friday, 20th February, 1948

Discussion on the Treatment of Septic

ABORTION

Dr. A. Melvin Ramsay (North Western Hospital) analyzed the results of 1,430 cases of postabortum sepsis which had occurred in the London County Council Puerperal Sepsis Unit, between January 1937, and December 1946. Of these 1,217 had uncomplicated uterine sepsis and 213 showed invasive complications. There were 47 deaths (3.3 per cent). The more invasive the complication the higher was the associated rate of removal of retained products under general anaesthesia. This was most marked in the septicaemia group; there were 54 cases, 30 of which proved fatal and 11 (36.7 per cent) of these had removal. The anaerobic streptococcus was the most lethal organism in postabortum sepsis and particularly liable to invade the blood-stream after intrauterine manipulation. A study of the postmortem records showed that placental remains were seldom found in the uterine cavity at autopsy. Of 32 cases in which no removal had been performed there were small placental fragments in 5 and a spongy mass of what was probably altered placenta in the sixth. While there is no objection to the removal of retained products under general anaesthesia in the uninfected case, care is required in dealing with cases of spreading infection, especially if peritonitis is present. It is wiser in such cases to first institute control of infection by specific chemotherapy. On the other hand, haemorrhage is a clear indication for removal and should be preceded by transfusion in the case of the exsanguinated patient.

Dr. Isabella R. Bishop stated that over 1,300 unselected cases of abortion admitted to St. James's Hospital, Balham, during the years 1942-47 inclusive were subjected to analysis. Of these 15.8 per cent were septic.

In a total of 2,310 cases of abortion admitted during this period 10 deaths occurred. Two of these deaths were not due directly to the septic abortion. Of the others the main cause of death was gas gangrene infection.

The criteria of septic abortion were similar to those adopted by Stallworthy.

The causal organisms were mainly bacillus coli and staphylococcus albus; occasionally anaerobic streptococci, haemolytic streptococci and clostridium welchii were isolated.

Two modes of treatment were adopted in septic cases. Excessive haemorrhage was considered the only indication for immediate surgical intervention. In all other cases with pyrexia associated with slight bleeding conservative measures were adopted. Chemotherapy was given until the temperature was normal for 48 hours when evacuation of the uterus was performed. Packing was used only to control haemorrhage. Haemorrhage was found not to be a marked feature in septic cases. In 25 cases only was blood transfusion considered necessary. When spreading infection was present intervention was reserved for those cases who continued to bleed. Pelvic abscesses occurred in 6 cases.

Dr. C. W. F. Burnett stated that at the West Middlesex County Hospital an abortion is considered to be septic if the temperature is maintained above 99°F. for 24 hours during or within 2 weeks of its occurrence and is not accounted for by any extraneous lesion, or alternatively if signs of intrauterine or periuterine infection are present. In 1946 and 1947 out of 1,035 cases of abortion treated in hospital 115, or 11.1 per cent, were septic, of which 20.8 per cent were acknowledged criminal in origin, 83.5 per cent were limited to the uterus, and 16.5 per cent spread either locally or generally. In the former cases, immediate evacuation of the uterus was done if haemorrhage was severe; if haemorrhage was slight the sepsis was brought under control by antibiotic and chemotherapy and the uterus emptied 24 hours later; if however the infection showed no signs of becoming controlled after 24-36 hours, further waiting was useless, and evacuation was then done. Figures quoted showed that results in these cases were less satisfactory, and so justified an attempt to control the sepsis. During the operation, dilatation of the os did not seem to be harmful, but curettage, intrauterine packing, douching and oxytocic drugs were better avoided. The haemolytic streptococcus Group A was a rare pathogen in these cases; there was one death from septicaemia occurring shortly after admission to hospital. For anaerobic infections the aromatic

diamidines should be given a trial, and some markedly beneficial results had followed intravenous injections of propamidine, at a dosage of 2 mgm. per kilogram of body weight.

Mr. John Stallworthy stated that he was basing his comments on a consecutive series of 800 incomplete, inevitable and septic abortions treated in his department at Oxford. Eighty-five of these were septic by the standards laid down in the article in the British Medical Journal of July 1947. A plea was made for the prevention of septic abortion. A wider use of the facilities provided for family planning would lessen the incidence among married women. Many cases of septic abortion were the result of leaving incomplete abortions unevacuated, and the only death in the series under discussion was in such a case. The necessity for employing modern surgical technique in procuring therapeutic abortions was stressed, and two-stage methods such as the use of tents and plugging were condemned.

In the treatment of septic abortion the two main enemies were haemorrhage and sepsis. The placental site was a wound. When it was clean it should be left alone; when it was infected, the infection should be treated; when it was bleeding the haemorrhage required treatment. This consisted of restoring any severe blood-loss by transfusion and evacuating the uterus to prevent further loss. In the total series analyzed transfusions were given in 14 per cent of cases, but in the septic group in 25 per cent.

The special problems of cl. welchii infection were discussed. It was noted that the diabetic patient was particularly susceptible to infection by gas-forming organisms, and reference was made to the work of Kemp at Oxford in this connection. The following points were illustrated by reference to cases:

- (1) Adrenal cortex preparations could be life-saving in keeping the blood-pressure at such a level as to permit of renal function during the period of acute toxaemia.
- (2) Peritonitis should be treated conservatively by gastric or duodenal constant suction together with intravenous infusion.
- (3) All placental debris required removal. The case record of a patient who had recovered from a triple septicaemia: cl. welchii, b. coli and

penicillin-resistant staphylococcus aureus was briefly presented.

#### THE EDINBURGH OBSTETRICAL SOCIETY

At a meeting of the Society on 10th March, 1948, the President (Dr. W. F. T. Haultain) in the Chair, a paper was presented by Dr. Richard de Soldenhoff entitled:

HAEMORRHAGE IN OBSTETRICS: THE RELATION
BETWEEN THE GENERAL PRACTITIONER AND EMERGENCY SERVICES.

Dr. de Soldenhoff briefly reviewed the history of the treatment of postpartum haemorrhage and retained placenta, and discussed the present-day importance of haemorrhage as a cause of maternal death. By courtesy of the Department of Health for Scotland he was able to record that 99 maternal deaths from haemorrhage had been reported to the Department in 1946–1947. Sixty-seven were due to postpartum haemorrhage, and of these some 40 per cent were young primiparae. The majority of these women died in hospital, in Dr de Soldenhoff's opinion because they had been moved to hospital following the birth of the child while suffering from post-haemorrhagic collapse.

He referred to the arrangements in the County of Ayr where, since 1937, a whole-time obstetrician had been employed by the Local Authority. Since that date this officer had operated an emergency domiciliary service, chiefly for the resuscitation of such cases. Dr. de Soldenhoff had held this post since the autumn of 1946 and recorded the methods of operation of the service as modified in his hands. The equipment, readily transportable, included all apparatus necessary for transfusion, and for dealing with retained placenta, incomplete abortion, etc.

It included blood and plasma supplied by the Glasgow and West of Scotland Branch of the National Blood Transfusion Association, and the resuscitation team always carried a citrate-containing flask for the immediate replacement of a portion of the blood donation by the contribution of a relative of the patient taken at the time of transfusion. A supply of high titre Anti CD serum was included to avoid the dangers of Rhesus blood incompatibility or artificial immunization. Dr. de Soldenhoff recorded figures relating to the operation of the service in 1937–38 and in 1947, with a number of interesting comparisons.

Dr. de Soldenhoff then discussed the guiding principles in the management of third-stage haemorrhage, postpartum haemorrhage, antepartum haemorrhage and incomplete abortion. Immediate manual removal of the placenta was advocated for any third-stage haemorrhage. of severe degree. He believed the dangers of this procedure as an essential part of training for midwifery. He condemned the Credé manoeuvre. He advocated the vaginal pack for certain emergency cases of antepartum haemorrhage, and early curettage for incomplete abortions. He warned against the dangers of over-transfusion of obstetrical patients and advised against slavish reliance upon sphygmomanometer readings as an index of progress. He considered methedrine to be a valuable drug in the temporary rising of bloodpressure during an enforced operation on a shocked patient.

The paper was discussed by a large number of those present, including the President. It was agreed that the general use of such emergency services as those described was desirable. A number of the general practitioners present confessed to timidity in regard to manual removal of the placenta. Dr. de Soldenhoff replied reassuringly.

#### REVIEWS OF HOSPITAL REPORTS

MEDICAL AND CLINICAL REPORT OF THE ELSIE INGLIS MATERNITY HOSPITAL, EDINBURGH, FOR THE YEAR 1946.

This is a comprehensive report although not set out with single-case data for all or most abnormal conditions. These are given in cases of eclampsia, placenta praevia, breech deliveries and multiple pregnancy. Sufficient detail, however, is given in a condensed form to show the nature of the obstetric cases with which the hospital deals and that the standard of its work is high.

There were 1,675 admissions during the year, resulting in 1,420 confinements (including 38 abortions), while on the district there were 608 confinements (including 8 abortions).

The number of beds in the hospital is not given. There were 8 maternal deaths in the hospital—a mortality correctly stated as 5.63 per thousand, on page 5, and incorrectly stated as 3.5 per cent on page 23. The maternal morbidity (on a defined variation of the M.O.H. standard of puerperal pyrexia) was 3.6 per cent in the hospital and 0.65 per cent on the district. The stillbirth and neonatal death-rates in the hospital were 34 per 1,000 and 28 per 1,000 respectively.

Cases of pre-eclamptic toxaemia and of hypertension are shown separately. The standards for the former are (a) blood-pressure of 140/90 or more with albuminuria, or (b) blood-pressure of 130/90 or more with oedema or headache. For hypertension the standards chosen are (a) essential hypertension, a blood-pressure of 160/100 or more recurring throughout pregnancy; and (b) raised bloodpressure, a blood-pressure, systolic or diastolic, raised 20 or more on original reading. The incidence of pre-eclamptic toxaemia and of hypertension as so defined was 5.7 per cent and 2.2 per cent respectively. The foetal mortality within these groups was 12.3 per cent and 10.8 per cent respectively. There were 3 cases of chronic nephritis and among them there was no foetal mortality.

Among the 17 cases of uncomplicated primigravid breech, where the child was delivered by the vaginal route the foetal mortality was 2 (11.7 per cent). Placenta praevia (20 cases) resulted in a foetal mortality of 28.6 per cent.

There were 8 maternal deaths. One resulted from acute symmetrical cortical necrosis of the kidney concealed accidental haemorrhage: another was due to rupture of the uterus through the scar of a former classical Caesarean section. In the remaining 6 fatal cases post-partum haemorrhage or shock was a significant feature. Sepsis is conspicious by its absence. Yet it is ever a pos-Swabs are taken from the fauces and vagina of all patients on admission and again on the fourth day of the puerperium: they are also taken from the cervix prior to surgical induction of labour. Haemolytic streptococci were recovered from the fauces on 6 occasions; and from the vagina on 24 occasions-Group A on 4, Group C on 3, and ungrouped on 17 occasions.

A critical survey of trends and practices and results is not attempted. A differentiation is not made between booked and non-booked cases.

CLINICAL REPORT OF THE NATIONAL MATERNITY HOSPITAL DUBLIN, FOR THE YEAR 1946.

The hospital has II4 maternity beds of which 28 are reserved for antenatal cases, 78 for postnatal, and 8 for the purposes of isolation. During the year there were 4,220 admissions resulting in 3,668 deliveries. In addition 476 deliveries occurred in the extern maternity service. There were 5 maternal deaths among the intern patients, giving a mortality figure of I.36 per I,000 deliveries; if the extern deliveries, among which there was not one fatal case, are included the mortality figure for the whole service of the hospital is I.2 per I,000 deliveries. The morbidity-rate (B.M.A. Standard)

for intern patients was 1.77 per cent. Among 3,393 viable (28 weeks or over) infants born there were 97 (2.9 per cent) stillbirths and 194 (5.7 per cent) neonatal deaths.

It will be evident that the hospital's high standard of midwifery has been maintained and in some respects improved. Of the 5 maternal deaths all were emergency admissions. Death is described as unavoidable in 3 cases: in 2 of these advanced cardiac disease was the cause of death. while in the remaining I advanced carcinoma of the lung was responsible. Two deaths were probably avoidable, although doubtless unavoidable after admission: in one the patient, who had not had any antenatal care, was admitted in eclamptic coma; while in the other forceps had been applied, with failure to effect delivery, before admission and before full dilatation of the cervix, and death resulted from sepsis after craniotomy and extraction in hospital. The stillbirth-rate has been reduced by I per cent over the previous year's figures but the neonatal mortality has not improved.

The report follows its customary lines with the critical survey of the year's work in the obstetric and paediatric departments with, in addition, very detailed particulars of each case in the abnormal conditions customarily encountered.

It is interesting to observe that in II cases symphysiotomy was performed with very satisfactory results in spite of 2 stillbirths. Caesarean section continues to be used liberally in the treatment of placenta praevia. The placenta praevia tables, however, are arranged in a somewhat confused manner and the number of neonatal deaths in the single-case data does not correspond with that in the legends at the head of the tables. There was no maternal death from this condition, and the gross foetal loss is said to be 40 per cent.

Detailed figures are given covering the work of the paediatric, gynaecological and radiological departments.

The critical survey is a valuable feature of a report such as this. Here we find not only conclusions reached by outstanding clinicians after great experience in their specialties, but also adverse criticism of the hospital and its facilities if that should be required. More accommodation is considered to be necessary for the isolation and special nursing of premature and difficult babies. This proposition is said to be accepted by every-

one concerned "... but the time it takes to get started on the erection of the necessary accommodation is beyond belief; meanwhile babies die."

How essential it is that our profession should continue to have complete freedom in the matter of publication!

MEDICAL AND CLINICAL REPORT OF THE SIMPSON MEMORIAL MATERNITY PAVILION, ROYAL INFIRMARY, EDINBURGH, FOR THE YEAR 1946.

THE general format of this report is similar to that of previous years. During the year 4,519 patients were treated in the hospital. Of these 3,404 were delivered after the 28th week of pregnancy and 355 before the 28th week (abortion). In addition 1,343 patients delivered in their own homes were cared for by the hospital staff—1,326 after and 17 before the 28th week of pregnancy.

There were 12 maternal deaths in the hospital, and I in a case transferred to the City Fever Hospital. From the Comparative Table of the principal statistics for the years 1933-1946 it can be seen that the 1946 death-rate of 0.18 per cent is the lowest during this 14-year period. While this must be gratifying to the staff it could have been still lower. Without question 2 cases of cardiac disease, 1 of cerebral thrombosis and 1 of miliary tuberculosis (the transferred case) were unavoidable deaths. One case of rupture of the uterus (booked) might perhaps have been saved by surgery in addition to the blood-transfusion given, but we are not told the estimated time interval from the occurrence of rupture until death. In the other case of uterine rupture (not booked) a para 5 patient, admitted following unsuccessful attempted manual rotation of the head, died 5 hours after craniotomy performed in hospital; the rupture was found at post-mortem examination. These last 2 cases, and I case (non-booked) of septicaemia following dystocia, in which death occurred 31 hours after admission, form an intermediate group of doubtful avoidability.

Post-anaesthetic death is the description given to 2 fatal booked cases in which death occurred shortly after forceps delivery. Renal failure following blood transfusion was responsible for death in 3 cases. In each case third-stage haemorrhage

was the reason for the transfusion: in each case transfusion incompatibility appears to have been the cause of death which occurred 8, 9, and 11 days respectively after the original postpartum haemorrhage. Blood grouping, including the rhesus factor, does not appear to have been carried out before these transfusions. In the final fatal case a patient with a history of adherent placenta in 2 previous pregnancies had a profuse postpartum haemorrhage with retained placenta following spontaneous delivery at home. After a bloodtransfusion had been given she was admitted to the hospital, where she arrived extremely shocked, and died, in spite of plasma and further blood transfusion, with the placenta still retained. In these 6 cases death should be classified as avoidable.

It is most regrettable than any woman should die as the result of blood loss. The beneficial effects of transfusion are well known, and its dangers are now appreciated generally. In many clinics blood grouping is carried out on all antenatal patients, but this is by no means a universal practice. Should not obstetricians urge that every pregnant woman's blood group should be ascertained, whether she attends an organized clinic or her family doctor for antenatal care, and insist that omission to do so should be considered as reprehensible as the omission of blood-pressure readings and urine testing in the antenatal period is considered to-day? Some may say this is impracticable. The same was said a little over 30 years ago about antenatal care as it is known to-day. Hospitalization for confinement seems desirable in any woman giving a history of postpartum haemorrhage or difficulty in the third stage of labour on a previous occasion. Almost all obstetricians are now agreed that when serious postpartum haemorrhage has occurred in the patient's own home, she should not be moved to hospital until her general condition has been improved by oxytocics and blood-transfusion. It may indeed be desirable that the entire treatment, including manual removal of the placenta under anaesthesia, following transfusion of blood, should be undertaken in the place in which the postpartum haemorrhage occurred.

Not one patient died of the 35 who suffered from eclampsia. No comment is made about this remarkable achievement in the report. This might very well have been incorporated in a critical summary, had there been one, with some descrip-

tion of the general plan of treatment followed in these cases. Single-case data of these cases, however, are given, as they are also for multiple pregnancy, placenta pyrexia, primigravid breech deliveries, and embryotomy. A detailed paediatric survey completes the report.

# CLINICAL REPORT OF THE MATERNITY DEPARTMENT OF GUY'S HOSPITAL, LONDON, FOR THE YEAR 1946.

In this report the customary categories of "booked" and "non-booked" cases are replaced, on account of peculiar local conditions, by two special classes, A and B. A small compact area is served by Guy's Hospital largely to the exclusion of other institutions and individuals. Class A includes all patients ordinarily living in the Guy's Hospital Maternity District, whether delivered in their own homes or in the hospital, and whether or not they have attended the antenatal department during the pregnancy. Class B includes all other patients, i.e., patients ordinarily living outside the District. Most of these were sent to the hospital on account of some anticipated difficulty and some had received antenatal care at the hospital. Class A represents the unselected midwifery practice of a very compact district which, it is considered, may be taken as an average sample of the general population although, of course, it deals with only one particular social class.

The total number of patients treated in the maternity department or in their own homes was 1,210. Of these 1,069 belonged to Class A, and 141 to Class B. The interest in this report lies in its being a picture of unselected midwifery practice, and the original report should be consulted by those interested in this aspect. Naturally the numbers in the different abnormal conditions are not high, e.g., breech delivery 31, transverse lie 1, face presentation 2, complex presentation 1, contracted pelvis, including relative disproportion between the pelvis and normal foetal head 26, accidental haemorrhage 23, placenta praevia 7, eclampsia 0. Single-case data are given in the principal abnormalities.

One table is devoted to albuminuria and chronic nephritis. Cases of toxaemia without albuminuria

are not recorded at all, but toxaemia without albuminuria must be recognized as an entity, for in the induction of labour tables we are told "for albuminuria read toxaemia", and the number of inductions for toxaemia exceeds the number of cases of albuminuria in which labour was induced.

Postpartum haemorrhage occurred in 65 cases without a fatality. In 13 the treatment was Crédé's expression of the placenta but whether anaesthesia was used for this is not recorded. Transfusion with plasma or blood or both was necessary on 3 occasions. Caesarean section was performed 35 times (2.9 per cent). Forceps was used for delivery on 86 occasions (7 per cent).

There were 2 maternal deaths in Class A and none in Class B. In the first, serious concealed accidental haemorrhage in a severe case of toxaemia was followed by suppression of urine; extensive bilateral symmetrical cortical necrosis was found at autopsy. In the second, abdominal hysterotomy was performed for severe hypertension (bloodpressure 220/140) and albuminuria at 18 weeks; a second pulmonary embolism occurring on the 26th day proved rapidly fatal.

Brief particulars are given of puerperal morbidity and paediatric statistics.

MEDICAL REPORT OF THE ROYAL SAMARITAN HOSPITAL FOR WOMEN, GLASGOW, FOR THE YEAR 1946.

This report deals with patients discharged from the wards of the hospital during the year 1946.

Following the custom of previous years the bulk of the report consists of tables giving details of the aetiological factors involved in the production of the pathological lesions encountered, the operations performed, the pathological lesions encountered and brief summaries of each fatal case.

A note on the services of the pathological department, and a short report from the radiological department with follow-up tables of cases treated by that department from the years 1939–1946 complete the report.

The total number of patients was 3,890, and the number of operations performed was 3,634, of which approximately one-third were operations of a major nature. The largest single aetiological factor for the lesions encountered was injury associated with childbearing, which was noted in 33 per cent of the cases. Death occurred in 22 cases.

Among the fatal cases, death occurred 4 times following sub-total hysterectomy for uterine fibromata and 5 times following operation for repair of genital prolapse.

Anthony W. Purdic

#### REVIEW OF CURRENT LITERATURE

The Journal is fortunate in being able to run this Review in conjunction with the Abstracting Service of the British Medical Association. All the abstracts of this service which cover obstetrical and gynaecological literature and literature on the new-born are at our disposal. The Review will, however, contain in addition abstracts and titles of articles which, though not of sufficient general interest for publication in the monthly volumes published by the British Medical Association, are yet sufficiently important for a specialist journal. It is to be hoped that our readers will collaborate in the preparation of these abstracts. Those who are willing to take part in the service are invited to communicate with the Editor, The Abstracting Service, B.M.A. House, Tavistock Square, London, W.C.r. There is special need of abstracters in foreign languages, and when offering his or her services the writer should indicate the language (apart from English) in which he or she is proficient. The name of the abstracter will be acknowledged in the text and payment will be made at the rate of ten shillings per abstract for English articles and twelve shillings and sixpence per abstract for articles from foreign languages.

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## THE

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## THE INVESTIGATION AND TREATMENT OF "BORDER-LINE" CASES OF CONTRACTED PELVIS\*

BY

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In a low-ceilinged large lumber-room on the top flat of the old Glasgow Maternity Hospital in Rotten Row-cleared of bedsteads and hospital junk and improvised as an operating theatre-I was introduced to the problem of contracted pelvis and witnessed my first Caesarean section. This was in 1889, while I was a senior undergraduate. The patient was a rachitic dwarf with all the characteristic features—pointed chin, prominent frontal eminencies, incredibly short and twisted legs-of these heroic little creatures. She shuffled into the simple operating theatre crowded to capacity by doctors: for word had gone round that Murdoch Cameron was going to perform a Caesarean section. Already he had three successes to his credit—his first having been performed on 10th April, 1888. In those days this was an outstanding achievement, and single successes were noised abroad in the medical world and recorded in the pages of the Lancet and the British Medical Journal.

Quite probably on the same day another member of the hospital staff dragged out of a small pelvis the bruised and moulded head of a well-developed foetus with forceps or broke it up by craniotomy, if by brute force he failed to extract it; or he might have performed version, the alternative to forceps delivery. In such surroundings I was nurtured in obstetrics, for to the Glasgow Maternity Hospital there were admitted in those days (and even to-day) an enormous number of cases of pelvic deformity of every variety and degree.

Here let me put on record my indebtedness to my two great teachers—the erudite Professor Leishman (father of Sir William Leishman) and his successor, Professor Murdoch Cameron, whose dexterity as an exponent of technique in difficult vaginal deliveries was unsurpassed by any obstetrician I ever encountered in this or any other country. And I must also include Malcolm Black and Robert Jardine, two of my senior colleagues, both of whom were most skilled practical obstetricians.

Looking back and comparing the conditions in the "eighties" of last century with those of to-day, I am truly amazed

<sup>\*</sup> The William Meredith Fletcher Shaw Lecture. Delivered at the Royal College of Obstetricians and Gynaecologists. 22nd May, 1948.

at what has been accomplished. Never in the history of obstetrics—and the same applies to all branches of medicine has progress been as dramatic as during these 60 years.

In introducing this subject of contracted pelvis I would remind listeners that the problem has changed in recent years. The grosser degrees of malformation, more particularly of the rachitic type, are less frequently encountered to-day. feeding and supervision of the infant and young child have brought this about. And I see every prospect that this trend will continue and that rachitic deformities of the grosser type may come to be almost entirely eliminated. There will, however, always remain examples of minor deformities of rachitic and other malnutritional origin; and, needless to state, many due to errors in development of a genetic nature more obscure in origin. This being so the obstetrician of to-day has to be on the lookout not so much for grosser abnormalities easily recognizable, as for minor variations of pelvic formation easily missed. It is true that most of the latter are of no great significance; but of many this cannot be said, and particularly does that apply if the variation is of the android type (Caldwell and Moloy classification, 1939).

Our goal in obstetric practice is to bring down maternal mortality and morbidity, and the stillbirths and neonatal death rates to the irreducible minimum. ·maternal side our goal is almost within This, however, is far from being the case as regards the child—the wastage in infant lives is still far too great. Prematurity apart—which admittedly takes the heaviest toll-there are far too many infants lost by indifferent obstetrical technique in the delivery. And in a considerable number of instances this is primarily due to a failure to recognize beforehand those minor variations in pelvic

formation which just tip the balance against a spontaneous birth or an easy delivery with forceps. And here is a further point—not sufficiently appreciated—these variations very often affect the outlet more particularly and are overlooked because the obstetrician concentrates attention on the pelvic brim.

As it is impossible to cover the whole field of contracted pelvis in a single lecture, I have selected dystocia in minor variants for consideration this afternoon. We obstetricians colloquially designate cases in this category as "border-line cases". They constitute a definite and most interesting group; as they demand very special antenatal investigation, and most careful supervision during labour. Furthermore, I am going to deal with the primigravida almost exclusively.

Pelvic formation and capacity, however, is only one factor—although admittedly the most important—which influences labour in contracted pelvis. There are the five others. Size of foetal head. Mouldability of foetal head. "Give" in the maternal pelvis. Degree of rigidity of the cervix. Efficacy of the forces.

The concern of the practising obstetrician is to determine before labour, or failing that early in labour, the extent to which these six factors are likely to affect the labour in the particular patient; for each patient is a specific problem just as truly as every stroke at golf or at snooker is a specific shot.

#### PELVIC FORMATION AND CAPACITY.

This factor can be determined with exactness by radiography. I lost the opportunity of making a great name for my medical school and for British obstetrics when I failed to persuade the late J. R. Riddell, one of the leading radiologists in Glasgow, to take up the subject of pelvic radiography in the early years of the century. After

reading the earliest communications on the subject by Budin (1897) and by Albert (1899), I felt certain that pelvic radiography had a tremendous future. Riddell and I did work a little at it, and Riddell contributed a paper to the British Medical Journal in 1907 and an appendix to the first edition of my "Operative Midwifery" published in 1908. Unfortunately, however, he never pursued the subject further, although I implored him to do so. Amends were made by British radiologists-Roberts, Rowden, Reece, Nicholson, and others, but that was many years later and by that time our American friends Thoms, Caldwell and Moloy, d'Esopo, Jarcho and a host of others were in the field with full equipment in all their large maternity hospitals. I mention this specific experience in order to impress on you of a new generation the supreme importance of being alert and keeping your minds ever receptive to suggestions. That does not imply that you should be "carried about with every wind of doctrine" as pertains in some countries—you are too British for that!

It is accepted as a first principle in medicine and surgery that diagnosis should be as exact as possible and that every new method of examination, once it has been proved to be sound, useful, and practicable, should be invoked for this purpose. Radiography has been welcomed and is extensively employed by physicians and surgeons as an aid to diagnosis. Yet, today, although it has been proved that a picture of the pelvis can be obtained by radiography more exact than can be constructed by any other means, there are practising obstetricians, familiar with its complications, who are lukewarm to its routine employment for the specific purpose we are discussing, viz., diagnosis of formation and mensuration of the pelvis.

Now why should this be? A radiograph

of the pelvis has only to be taken once in a woman's lifetime; the cost need not be great; and only the comparatively few living in some remote locality are put to any inconvenience in having this examination carried out. It is the same old storyopposition to any precautionary procedure which magnifies the seriousness of childbirth, and satisfaction with existing conditions. In the forty-odd years I practised obstetrics I witnessed opposition to a more thorough employment of antiseptics-to greater care in the choice of analgesics and anaesthetics—to the use of rubber gloves to the wearing of masks-to a more thorough antenatal supervision—to institutional treatment in preference to domiciliary treatment for primigravidae—to restricting practitioners from engaging in obstetrics until they have undergone a special training in obstetrics after graduating in medicine, as recommended by the Royal College of Obstetricians and Gynaecologists (1944). It is also true, however, that I have seen most of these walls of opposition razed to the ground, as will happen in course of time to the last two mentioned as certainly as to-morrow's sun will rise. Whenever I get depressed about any hold-up in progress I recall to mind the fact that it took Lister 20 years to convince the surgeons of London of the efficacy of antiseptics.

I do not think that, with the knowledge now to hand regarding the influence exerted by even minor variations in pelvic formation, we who advocate routine pelvic radiography for all primigravidae have lost our sense of proportion in this matter as many suggest. On the contrary, it is quite within the realm of probability that before many years pass it will be accepted as an essential detail of the antenatal examination. To compromise and say that only if pelvic deformity is recognized by manual or instrumental (callipers) methods

is a radiograph of the pelvis necessary, begs the whole question, for there are most important deviations from the normal only recognizable by radiography. Even those of us who have by practice perfected ourselves in manual methods almost invariably derive additional information from inspecting a good radiograph of the pelvis. At least that was my experience in the last few years I was in practice. That is the position radiography should be given.

In support of this contention that every primigravida should have her pelvis radiographed let me present two imaginary cases. I have presented them before (Kerr, 1939) but they can stand repetition.

Case 1. The radiograph shows a typical female pelvis of normal capacity. Here the presentation in 80 to 90 per cent of cases will be a first or second vertex; but should an occipito-posterior position develop there need be no concern, for in most cases a long rotation will occur. A face or brow presentation is most unlikely, as also is prolapse of the cord. If at the 36th or 37th week a breech presentation is discovered, and even if the legs are extended and external version is unsuccessful, there need be no cause for concern regarding the delivery; in all probability it will not be very difficult. Further, in almost all cases, vaginal examination during labour can be dispensed with—the vaginal examination at the 36th week will have supplied all necessary information. The progress of labour can be determined by an occasional rectal examination.

CASE 2. The radiograph shows a pelvis of abnormal formation; but not of a gross type obviously necessitating Caesarean section. Here anything may happen. An occipito-posterior position in a large number of cases and the probability that it will take the short rotation and become persistent. Face or brow presentation and prolapse of cord are not improbable, while if the presentation is a breech and cannot be converted there will certainly be difficulty in delivering the after-coming head.

Take everything you can out of radiography! Do not try to determine how far you can dispense with it and how little you

1.0

need employ it. Physicians and surgeons do not consider such questions; they employ radiography to the fullest extent for purposes of diagnosis. And above all do not concentrate attention on brim formation.

Knowledge of possible difficulties in the delivery, furnished by a radiograph, should not make one unduly anxious or "panicky"; but it should cause one to be particularly watchful of that patient. Further, such a patient should have her confinement in an institution. My contention is that by having a radiograph taken at the 36th or 37th week—or early in pregnancy, as some claim, is an advantage—one is prepared for possible complications arising during parturition; they do not come upon one as surprises.

It has been suggested that the routine employment of pelvic radiography may lead to an increase in the employment of Caesarean section. But that will only take place if the obstetrician is ignorant of the proper employment of radiography and of the interpretation of the radiographic picture.

Chassar Moir (1947), than whom no one has given greater consideration to the problem, as a skilled radiologist and as an experienced obstetric operator, makes this statement: "In my experience radiology has oftener influenced me against Caesarean section than it has in favour of that operation." Thoms is of this opinion also. But Peter Allen (1947b) has had a less fortunate experience with practitioners.\*

To my mind the only relevant objection to meticulous antenatal supervision, in-

<sup>\*</sup>There are, unfortunately, a number practising obstetrics who—mostly because of ignorance—fly to Caesarean section on the slightest provocation. They have not studied the problem of "borderline" disproportion; they cannot read a radiograph correctly.

cluding a radiograph of the pelvis, is that it may "rattle" the patient. But patients are not "rattled" by doctors who give attention to details. The doctor who annoys them and loses their confidenceand incidentally helps to keep up the maternal and foetal death-rates—is the man who is casual, pats them on the back, and gaily tells them all will be well after a perfunctory antenatal examination. But let me emphasize the point that employment of radiographic methods for diagnosis implies that the obstetrician can interpret correctly the features of the radiographic picture; and incidentally also that the radiologist has had experience in radiography in its application to pelvimetry. Before I retired from practice I witnessed many faulty conclusions being come to when one or other had inadequate experience in this method of diagnosis. Which all goes to prove that obstetric practice should be in the hands of specialists, general practitioners specially trained in obstetrics and well-trained midwives.

The most useful single pelvic picture is a lateral radiograph. If all the features it reveals are satisfactory, or are sufficient in giving a complete interpretation of the specific pelvic abnormality, there may be no need to take a frontal one. Generally, however, if the lateral radiograph suggests any abnormality a frontal one should be taken to determine pelvic formation at brim, in cavity, and at outlet. You must not concentrate attention on the brim—very many of the less severe degrees of dystocia occur at the plane of "least pelvic resistance" and at outlet.

Here seems the most suitable point for a reference to the investigations and writings of Nicholson (1938, 1943), Ince (1939) and Ince and Young (1940), who favour directing attention not so much to particular diameters as to the plane area. The same idea, but in a simpler form, is Thoms's proposal to take the two principal diameters and add them together.

Nicholson gives the following figures for the pelvic brim:

Brim of 110 sq. cm. 99.9 per cent of heads will pass

But one has to remember that the area, which can be exactly determined by radiography, may not always be a potential area if the pelvic malformation is irregular or asymetrical. I can recall a number of cases illustrative of this point. One was a woman with a scolio-rachitic pelvis who was delivered in my department on three occasions. On the first two with the occiput towards the more roomy side she had a spontaneous delivery. On the third, however, the occiput was towards the narrow side and got held up and I had to perform Caesarean section. In another case in which the pelvis was of the Naegele type —of a marked but not extreme degree—I forecast a spontaneous delivery (with possibly forceps at the outlet), from an examination of the radiograph. What transpired was that the occiput became arrested on the narrow side and I had to perform Caesarean section. Could the occiput have been manipulated into the roomier side I believe a spontaneous delivery might have taken place. This case happened to be one of the last under my care before my retirement. Then there are the variants of the android type of pelvis in which the forepart is narrowed and the cavity and outlet deformities are the problem. Again there is the "high assimilation" pelvis (by no means a great rarity) in which extreme obliquity of the brim is the problem, as Malpas (1936) and Malpas and Hamilton (1939) have pointed out—a condition which very definitely interferes with engagement of the head.

One cannot be as dogmatic as Nicholson is on the exclusive value of area of the particular strait. Thoms (1941), Steel and. Javert (1942) all stress this point.

I agree with Peter Allen (1947a) of New Zealand when he states: "interpretations of areas should, therefore, always be done with one eye on the shape of the plane being considered and remembering that the calculation will be more accurate the closer the plane comes to the circular or regularly elliptical."

Allen (1947b) discusses this particular approach and compares his findings with those of Thoms (for brim), Nicholson, Ince and Young, Rohan Williams and Phillips. Exceptional cases are encountered in which Caesarean section was necessary with brim areas of 110 sq. cm.; and on the other hand successful and not unduly difficult vaginal deliveries where the area was 85 sq. cm. or even slightly less. And the same applies for midplane and outlet. But the areas may be slightly smaller for them without extreme dystocia resulting, because the lower pelvis often expands as the foetal head presses upon it.

Now, of course, these investigations are most interesting and valuable, but the practising obstetric specialist is not concerned so much with the percentages of heads which will, or will not, pass through a plane area (brim, cavity, outlet) of this or that dimension, as with what is likely to happen in the specific patient for whose delivery he is responsible.

It would appear, however, that this exact plotting out of areas at brim, cavity and outlet is an aid in many borderline cases to the sorting-out process which I will discuss in a moment or two; and this is the expressed opinion of Chassar Moir (1947). For example, as brim cavity or outlet areas fall below 95 to 100 sq. cm. the frequency of dystocia increases very decidedly and the expectation of a spontaneous delivery

or easy extraction with forceps at outlet declines; and becomes highly improbable at 80 sq. cm. and should not be reckoned on unless the child is premature or its head extremely small.

ESTIMATION OF SIZE OF FOETAL HEAD AND OF ITS ADAPTABILITY TO MATERNAL PELVIS.

Here also progress can be recorded. Let me review the stages by which it has taken place.

The simple methods of estimating the size of the foetal head by hands and callipers applied externally came to be replaced by a bimanual vaginal examination with the object of determining the relative size of head and pelvis. It culminated in the famous aphorism by Freeland Barbour-"The foetal head is the best pelvimeter" -which contains more of truth than do most aphorisms. Early in this field was the great French obstetrician, Pinard. His method, like those of Bethel Solomons, and Chassar Moir of recent date, was purely external. Müller's bimanual method was a great advance and I certainly think that my advocacy of utilizing the thumb along the pelvic brim to test the adjustment and overlap of the head was an improvement on Müller's method. He did not advocate the employment of the thumb as I stressed its importance.

For a time it appeared that by this examination at the 36th or 37th week the most suitable treatment for each particular case could be determined. But it was soon found that the changes which took place—the settling down and adjustment of head, softening and relaxation of lower segment and of cervix, and possibly also a slight "give" in the pelvis, between the 37th week and term, had very often put an entirely different complexion on the problem. I found that cases allowed to continue to term furnished many surprises. Most

surprising was the large number in which adjustment of the head to the pelvic brim occurred, although I and my assistants had not expected this was probable. Naturally, there were also cases in which the disproportion turned out to be greater at term than we reckoned at the earlier examination; but the former experience was much more frequent than the latter. And, curiously enough, this, too, is the experience of Williams and Phillips (1946) from their radiographic studies. Here is what they state: "In our series those predictions which have proved erroneous have almost without exception been unduly pessimistic."

I was forced, therefore, to the conclusion that the examination at the 36th to 37th week should constitute only a rough sorting into: (a) Cases in which the disproportion was so slight that given satisfactory forces the head would certainly be driven through the pelvis, or at worst would be easily extracted with forceps. (b) Cases in which the pelvic deformity was so pronounced that the foetal head could not pass and Caesarean section would have to be employed. In the true "border-line" case I found it impossible to prognosticate with any degree of accuracy whether the head might or might not pass. Thus it came about that I abandoned the operation of induction of premature labour in primigravidae in the early years of this century.

I always look back with particular satisfaction to one period of several months when I had a long series of contracted pelves admitted to my wards and the late David Shannon was my first assistant and Fraser Lee of Edinburgh my house surgeon. We took infinite pains in investigating these cases. By day and night we had consultations over them, and we secured wonderful results. In cases uninterfered with before admission to hospital we had no maternal death in spontaneous or

operative deliveries, and only one foetal death, and that was from prolapse of the cord.

Reference to this particular foetal death gives me the opportunity to remind you to be on the lookout for prolapse of the cord. During the last three years of my service in the Royal Maternity Hospital, Glasgow, this complication was recognized by my assistant (the late Alison Hunter) on four occasions in patients who were being given a "trial labour". Caesarean section was performed, and all the children were saved.

This particular approach to "border-line" cases can only be learned by accumulating clinical experience. It calls for patient observation of many, many cases. It cannot possibly be learned by those who freely employ induction of labour in primigravidae. But, as a charming Finnish lady—a patient of mine of long years ago—used to say of the business friends her husband brought to dinner, "For sem (them) I care not!"

The problem to-day is: Can this estimating of the relative size of foetal head and maternal pelvis which I have outlined -only necessary if the radiograph shows a pelvic abnormality—be rendered more exact by means of radiographic cephalometry? But before considering that specific question I must make reference to the investigations carried out by Hastings Ince (1939) on "Relation of Body Weight to Biparietal Diameter of Head" and the earlier investigation by Clifford (1934) on "The prediction of the Minimum and Average Body Weight to be expected from a given Occipito-Frontal Diameter." The tables bearing on these respective investigations are given by Browne (1946). They are well worthy of consideration.

It is important to try to estimate the size and weight of the child, for in general they run pari passu with size of head. In many cases one can determine fairly correctly by simple palpation whether a foetus is much below or much above the average, and naturally with greater accuracy if one has a good radiograph of it. But the degree of accuracy attainable is not always sufficient for the purpose. Nevertheless to try to assess size of child is advisable and helpful in making a forecast of the outcome of the labour and in determining the treatment which should be adopted.

To-day we have progressed a stage further, thanks to Reece, Rowden, Roberts, Chassar Moir, and Rohan Williams. You observe I mention only our fellow countrymen. I think we sometimes allow ourselves to be overwhelmed by the mass of contributions furnished by our good colleagues in the United States—great and impressive as they undoubtedly are—and tend to overlook what has been done and is being done at home. Now in this particular field of investigation (estimating relative size of head and pelvis) British obstetricians and radiologists have made contributions of great interest and value.

Did time permit I should very much like to discuss in detail this specific problem of estimating the size of the foetal head in utero by radiography. There is a tendency amongst some radiologists (e.g. Allen, 1947a, 1947b; Moloy, 1922; Thoms, 1941, 1946) to question the value of radiographic cephalometry—they seem to me to concentrate too exclusively on the pelvis.

Obviously if one could plot out a chart of of the foetal head with the exactness with which a chart of pelvis at brim, cavity and outlet can be plotted out, then by superimposing the former on the latter the likelihood of adjustment of head to pelvis in the course of labour could be predicted within a small margin of error. Now this is precisely what Chassar Moir, Rohan Williams and a few others are attempting. It is a stage in advance of previous methods, and should be

an aid to greater accuracy in making the "labour forecast".

As far as I can judge from their writings, however, it is impossible in many instances to ensure absolute exactness as regards cephalic diameters. For example, Williams and Phillips (1946) state: "Approximate cephalometry is relatively easy in most cases; accurate cephalometry is difficult in many cases." And so they have come to match the foetal heads with stock charts of foetal heads of different sizes (biparietal diameters between 9 and 10 cm.) which can be superimposed upon charts of pelvis at brim, mid-cavity and outlet. And Chassar Moir (1947) is now employing special graphs, as this method is time-saving.

Personally I am convinced that their investigations will prove to be of very great importance and practical value. Rohan Williams informs me that at Queen Charlotte's Hospital the "substantially correct" predictions have risen in the last 300 cases to 92.05 per cent (Arthure and Williams) from 90.11 in the first 300 cases.

I can hear some critics muttering that this investigation is too great a refinement. Don't listen to them! Look upon it as an example of the struggle that has gone on through the ages to attain perfection. Emulate rather the anaesthetists, who seem never to be satisfied with their drugs, equipment and contraptions but are always striving after something better. And I admire their keenness, and that they are not ashamed of showing it. Possibly this is because they have the exuberance of youth on their side; for their speciality is of yesterday; whilst ours had its beginnings in the primaeval forests, jungles and swamps, possibly millions of years ago, and we may have grown weary in the long struggle.

But enough for the factors which are to-day determinable with a very great degree of accuracy. Let us turn to the others whose influence on a labour is to a large extent guesswork, although not always to the degree generally represented.

## MOULDING OF FOETAL HEAD.

When I was seriously engaged in investigating the progress of labour in contracted pelvis I found I could make a fairly correct allowance for moulding in cases of flat pelvis, and if the head assumed an anterior parietal presentation. But I was unable to do so if the pelvis was generally contracted, or if the presentation was posterior parietal. It was, therefore, with great interest that I read this statement by Chassar Moir (1946):

"Now by revealing pelvic type, radiology will often indicate when moulding will and when it will not be an effective

factor."

You see, then, how helpful charts of pelvis and of head may be. But on this specific question (the estimation of the degree of moulding) consideration must be given to size of foetus, size and shape of its head, and the attitude the head develops. It is commonly assumed that 2 to 3 mm. in one diameter is about the degree of moulding one is justified in reckoning on. But much greater moulding than that figure may occur if the head is poorly ossified. And little moulding, if any, will occur if the head is large and round, as then generally it is more than usually ossified it simply remains perched up above the brim. The disproportion is primarily due to the foetus, and in such cases "trial of labour "is profitless.

A few years ago Moloy (1942) directed attention to the manner of moulding—to the effect pressure in one diameter of the foetal head had on the others.

These observations, as he indicates, must be looked upon as an introduction to what may prove to be an interesting and important subject. The outstanding feature of the contribution is Moloy's contention formerly questioned and denied by most writers—that the bones at the base of the foetal skull may also take part in the moulding when that becomes extreme.

It is doubtful if we will learn much from experiments with "towel compression" as illustrated in Moloy's paper, as rarely is compression on the head equal at all points. More, we imagine, will be learned from radiographs of the head taken during labour and immediately following delivery, before the bones have had time to readjust themselves to their natural condition prior to labour. A study of moulding may well give information regarding more serious types of moulding which one must be on the lookout for-and warn the operator in certain cases when trial labour should not be permitted to continue longer. And this would be determined by an intrapartum radiograph.

Here I would stress the value of intrapartum radiography if the labour is not progressing to one's satisfaction. You will hear much of this in the coming years. Such investigations are bound to furnish interesting and helpful information.

It may even happen that in carefully selected primigravidae, as experience increases, induction of premature labour may be justifiable; but this is a very different proposition to the promiscuous employment of the operation as pertains to-day.

# "GIVE" IN THE PELVIS.

More consideration should be given to this factor than it generally receives.

Radiography has confirmed what was claimed from earliest times, that a widening of the pelvic circumference occurs during labour, although not to the degree the ancients believed. This "give" in the pelvis is a result of softening of ileo-sacral

joints and symphysis pubis. Roberts (1934) of Liverpool took up the subject and furnished figures showing a 2 mm. increase at the symphysis pubis and a 2 mm. increase at the sacro-iliac joints. Abramson, Roberts, and Wilson (1934) wrote:

"The symphysis pubis regularly undergoes relaxation with an average increase of width of 3 or 4 mm. but that in about 20 per cent of individuals, for some unknown reason, the relaxation becomes much greater than this—sufficient in fact to be considered a pathological separation."

There has been a good deal of writing on this pathological luxation by James Young (1940) in this country, Heyman and Lundqvist (1932) in Sweden, and others. Both the physiological and pathological luxation are almost certainly hormonal in origin. They vary greatly in individuals, and only if pronounced can be appreciated by manual examination. One can frequently move the two pubic bones by grasping each between forefinger and thumb, or by getting the standing patient to throw her weight first on one leg and then on the other.

But there is a further point. This luxation of the pelvic joints develops as pregnancy advances and reaches its height in the premonitory stage or early in labour. Here arises a question which should be investigated: Is pelvic luxation more pronounced in a labour at term or does it occur to an equal degree if labour is induced at the 36th or 37th week? Because should the former be the case that would be an additional argument against induction of labour in a primigravida. I have no clinical experience to adduce one way or the other on this specific question.

This, however, I can testify to—and incidentally it is stressed by Nicholson (1938, 1943), and by Chassar Moir (1946, 1947)—the lower cavity and outlet often

"give" very appreciably during labour. Indeed this explains how it comes about that outlet deformities—measured most carefully with callipers and by radiography—which would appear to promise definite dystocia may not at the actual delivery prove as difficult obstructions as was anticipated. My countryman from the Outer Isles (Dr. A. J. MacLeod, of Lochmaddy, North Uist, 1936) is correct in his contention that he has been able to expand the pelvis with his hand. One might say, literally and metaphorically—he gave the pelvis the "big hand."

However, while there is almost certainly a fractional passive gain in the pelvis, the chief gain or give is brought about by the pressure of the foetal head on the pelvic wall during labour. And it is only in exceptional circumstances, already referred to, that this can be estimated beforehand. All I am contending is that here again, on occasions, the alert clinician may pick up a pointer as to the best procedure to be followed for a particular patient.

# CONDITIONS OF THE CERVIX EARLY IN LABOUR.

This is a detail which does not always receive adequate consideration. With a head held up at the pelvic brim dilatation of the os externum is naturally slower than in a normal labour in which the head sinks early into the pelvis; but the point I wish to make is not that specific phenomenon but rather the inherent character of the cervical ring as regards rigidity and dilatability in the particular patient.

In an ordinary labour the experienced obstetrician can predict generally and fairly early in a labour whether dilatation of the os externum will be slow and protracted, or rapid and easy, from the feel of the ring of the os externum. If, therefore, he finds that the rigidity of the ring promises an unusually slow dilatation it is generally

inadvisable to push "trial labour" very far. Now there is one type of pelvis in which dilatation of the cervix during labour is particularly slow and that is the round pelvis—the pelvis associated with the "dystrophia dystocia syndrome". There are a fair number of women in whom this syndrome exists to a minor degree, although I think Bryan Williams (1942) has probably put the figure too high.

Fortunately the condition of the os externum in labour and its behaviour as regards dilatation can be determined by rectal examination—a vaginal examination is quite unnecessary.

## THE STRENGTH OF THE FORCES.

Generally speaking the strength of the forces is unpredictable. But in quite a number of cases one can surmise that the forces will prove ineffective. For example, if the pelvis is associated with the "dystrophia dystocia syndrome" the forces will almost certainly let you down. Also in women of hystero-neurotic or the so-called highly strung type the forces very often fail; and of course there are a few who wilt and give out at the first pain. But my experience has been that the vast majority of women stand up to a stiff labour and have efficient forces, especially if supported by the psychological encouragement of nurse and doctor which Dick Read (1943) has stressed as being of so much importance.

And here a word or two on sedatives and analgesics. Good forces can very easily be killed by wrong or wrongly-timed sedatives and analgesics. This is one of the reasons why it is so important to have the primigravida with any pelvic abnormality in an institution where the staff (nurses and doctors) are familiar not only with the actual technique of delivery but with all the little details and subtilities in the management of labour and in the employment of sedatives and analgesics.

Once a patient has lost confidence in being able to effect the delivery herselfeither because of the faulty moral support given her by doctor or nurse, or because of injudicious choice of or timing of sedatives and analgesics—she will never regain it in that particular labour. And possibly not even in subsequent labours, as the experiences of the first may give her an inferiority complex re her power to effect the delivery by her own efforts.

One final point here. It is not always remembered that these sedatives and drugs given to the patient pass into the foetal circulation. For example, the danger of morphia when given late in labour has been well established. I have little doubt that now and again a child is lost during a trial labour from the drugs and sedatives employed.

From what I have said it is obvious that the "labour forecast" is most likely to prove correct if based upon a careful investigation and assessment (as far as this is possible) of all the factors concerned. The mistake is sometimes made by partisans of one or other particular investigation to concentrate on it, but one cannot afford to leave out of consideration any single factor. And again let me stress the point that skill in prognosticating the outcome of labour in "border-line" pelvic disproportion can only be attained by long apprenticeship at the bedside of patients in labour, supplemented by the radiologist's report and films; and on occasion by having intrapartum radiographs taken and a consultation with the radiologist. This approach to disproportion-dystocia is the only scientific approach; and incidentally it is full of interest to the team responsible for the delivery. Pursued in a teaching school it is of incalculable value in impressing upon students the importance of clinical observation. Correction of Personally, few experiences in my obstet-

1:Bliaki.

ric life have given me greater satisfaction than those in which the "trial of labour" proved justified and Nature triumphed, when the portents before labour were not too promising.

## TREATMENT.

When I was introduced to obstetrics in the late "eighties" Caesarean section—as we know the operation to-day—had been introduced by Kehrer (1882) and Sänger (1882) only a few years earlier, and the controversy on the respective merits of Version and Forceps had ended with the complete rout of the "Versionists"—version had been eliminated as a method of treatment for contracted pelvis.

The succeeding decade of the "nineties", which might be styled "the axis-traction forceps era", is one of the least distinguished epochs in the history of obstetrics; for although it witnessed a progressive employment of Caesarean section it also witnessed a very free use of axis-traction forceps and delivery by force. No obstetric school in this country gave it greater support than did Edinburgh. This lapse, however, may well be forgiven it when one considers the enormous services the Edinburgh school has rendered to obstetrics.

The last important discussion on the employment of forceps in contracted pelvis took place at the Annual Meeting of the British Medical Association in Carlisle in August 1896, and I happened to be present. The discussion was introduced by Milne Murray, who was then recognized as a great authority on forceps. He stated:

"During the last eight years I have delivered living children in several cases where the brim was not more than  $3\frac{1}{4}$  inches, and in one case, already on record, I delivered a living child where accurate measurements of the pelvis made post-partum and under chloroform showed that

the conjugate was not more than 2.75 inches. In this case the head was quite free when the forceps were applied, indeed, it had to be steadied by an assistant during their application."

Here were our results in the Glasgow Maternity Hospital at this time. In many cases attempts at delivery with forceps had been made before the patient was admitted to hospital.

Table of 130 cases in which the Conjugate Vera measured 3-3½ inches (7.5-9 cm.) delivered by forceps (1899-1906).

Conjugate Vera	3½ inches	3¼ inches	3 inches
Total cases Foetal deaths	39 <sub>-</sub>	52 12	39 18
Per cent	15	23	46

It is easy for you young obstetricians of to-day to express horror at the perpetration of the "high operation" with axis-traction forceps and the patient often placed in the Walcher position and the operator employing all his strength to effect the delivery. But the treatment had to be tried out. Obstetric specialists early realized that it was unscientific and most dangerous and gave it up. The tragedy lies in the fact that others, not specialists, continued to employ the "high operation"; and to-day it is being employed (although admittedly less and less every year) with disastrous results. Truly-"The evil that men do lives after them."

Even the "mid-pelvic operation" should be employed with great discretion and only if the outlet contraction is very slight and if the cause of the arrest of the head is primarily due to ineffective forces, or faulty position and attitude which can be corrected before application of the forceps. In this particular type of case a large caput succedaneum may give the impression than the head is lower than it actually interally

again an intrapartum radiograph is of incalculable service.

Induction of Premature Labour.

I have already given my reasons for being opposed to this operation in primigravidae. I consider it far too haphazard a procedure. On the other hand, judiciously employed in plurigravidae it fills a most useful place. The number of unnecessary Inductions of Premature Labour being performed annually on primigravidae in this country may well run into thousands. In no other country does this pertain—are we right and is all the world wrong?

And the operation is by no means free from risks. I have known of several deaths which have followed its employment, of injuries to the cervix and to the lower segment; and the incidence of morbidity following it has been raised again recently by Roblee (1947) and commented upon in an editorial in the *British Medical Journal* (1948). But I cannot possibly pursue this subject further on the present occasion.

To settle this question of Induction of Premature Labour in primigravidae for contracted pelvis once and for all I suggest that our College appoint a committee of inquiry to go into the matter and into the next treatment I am about to refer to, viz. "Trial of Labour". We must have mass figures. Reports by individuals for or against induction of premature labour and trial of labour in primigravidae are not sufficient for the purpose of assessing the relative merits of these two procedures, or if one or both is unsuitable.

### Trial Labour.

Stander (1945) has made rather an interesting distinction between (a) Trial Labour and (b) Test of Labour. The former as he defines it, and as most of us understand it, is to permit the labour to run limited period and then to judge from seda.

developments whether or not to allow it to proceed. The latter or "Test of Labour" is to give the labour its fullest chance. Here is Stander's statement on the subject:

"Trial labour must not be confused with a true 'test of labour', by which is understood a labour up to the point of full dilatation of the cervix for a period of two hours or longer with the membranes expanded. Of our patients with contracted pelves very few indeed are subjected to a true 'test of labour,' and we are of the opinion that the judicious employment of a 'trial of labour' of some hours usually enables one to foretell accurately whether or not a spontaneous outcome will result."

With this statement I am in agreement, provided the trial of labour gets a fair trial, and that in many instances cannot take place until after the membranes have ruptured and the foetal head has become adjusted to pelvic brim. It not infrequently happens that the labour is hesitant in the first few hours and particularly if the membranes remain intact. None the less the obstetrician of experience can very often surmise its probable course even before the membranes rupture. Prolapse of the cord is almost the only danger to the child at this stage. As already explained, if this should occur Caesarean section is the best procedure.

Now comes the final decision after the labour has proceeded 2-4-6 hours subsequent to rupture of the membranes, when one can nearly always forecast the outcome by determining the position and attitude the head is assuming, the extent to which it is sinking into the pelvis, the quality and duration of the uterine contractions, the fortitude the patient is manifesting, and so on. And naturally, all the time a careful note is kept of the behaviour of the foetal heart; but the observations should not be made too frequently, otherwise the patient may become anxious.

And what can I tell you about results? I can tell you this. No method of treatment gives better results than spontaneous delivery or delivery with a little well-timed assistance from forceps at the outlet supplemented by an episiotomy. But always with this proviso: that the trial of labour is not pushed too far.

In going over the Medical Hospital Reports of a large number of maternity hospitals I extracted these results in one of them:

"BOOKED CASES" OF SPONTANEOUS DELIVERY IN CONTRACTED PELVIS.

	Primiparae at term	
St. Mary's Hospitals, Manchester, Medical Reports,		
1939-1941	75	o 

Duration of labour was prolonged: I to 96 hours, I to 60 hours, I to 58 hours, I to 49 hours, 2 to 48 hours, and I to 44 hours.

48 hours, and I to 44 hours.

Weight of child: I was 9½ pounds, I was 9 pounds, I3 were 8 pounds or fractionally over that figure.

Now, of course, perfect results such as the above do not often occur; and only in patches, as all of us know. Nevertheless, if large series of cases of "spontaneous delivery" in contracted pelves are investigated it will be found that the foetal mortality is extraordinarily low. And here are two by way of example: Stander states that for the series (3,370) maternal deaths were 2.1 per thousand. Foetal deaths (gross) 5.1 per cent. (Privately communicated April 15th, 1948.)

The picture, however, assumes a less favourable aspect if trial labour is pushed too far. Peckham and Kuder (1934) as a result of their investigation of 432 cases of "trial labour" in the Obstetrical Service of Johns Hopkins Hospital, Baltimore, state:

"However, if the trial of labour is allowed to progress more than 30 hours the foetal mortality rises to the appalling figure of 19.23 per cent (gross) and the wisdom of allowing a test to become prolonged seems extremely dubious."

The duration of the trial of labour that should be permitted (or is justifiable) depends on the individual and the circumstances of her labour. The obstetric surgeon must retain a balanced judgment and not allow himself to become a partisan for this particular procedure. And he must bear in mind that a prolonged trial of labour ("test of labour" of Stander) is demanding a very great deal from any parturient when Caesarean section (lower segment operation) is attended to-day with such extremely low maternal and foetal death rates.

One last and very important point before I pass on to Caesarean section. If the "trial labour" is not progressing as one

Sı	SPONTANEOUS DELIVERIES IN CONTRACTED PELVIS.			
	Total cases of contracted pelvis	No. of cases	Maternal deaths	Stillbirths and neonatal deaths
Royal Maternity Hospital, Glasgow, 1930–1933	1,714	597 (34.5 per cent)	(o.1 per cent)	24 (4 per cent corrected) 6 intra- cranial injury, 8 prolapse of cord, 10 not determined
New York Lying-in Hos- pital, 1932-1947	3,370	1933 (57.4 per cent)	0.2 per cent	5.1 (uncorrected) per cent.

had hoped, much has been gained, for a well-stretched-out lower uterine segment has developed meanwhile, ideal for the "lower segment" operation.

Caesarean section. The present is not the occasion, nor will time permit, to discuss the evolution of the operation during the last 50 years. We have, to-day, two outstanding monographs which deal specifically with this subject, "Caesarean Section: Lower Segment Operation," by C. McIntosh Marshall (1939), and "Caesarean Section, the History and Development of the Operation from Earliest Times," by J. H. Young (1944). Each has rendered a very great service to British obstetrics, and I am delighted to be given the opportunity of stating this publicly.

It was a slow business persuading obstetricians that the lower segment incision is the best approach to the interior of the uterus and that a transverse incision is better than a longitudinal one. The lower segment operation has been so perfected that in uninfected cases a maternal fatality is a great rarity. Even in infected cases, with sulpha-drugs and penicillin the death rate is very low. So low, indeed, that it is questionable if the extra-peritoneal operation is ever necessary or is likely to give better results.

The idea of Physick (1824) to create a port of entrance to the lower segment by separating the unopened lower sac of peritoneum from the bladder and then to pull the former upwards and the latter downwards was a wonderful conception. In practice, however, it is extremely difficult to avoid occasional button-holing of peritoneum and of bladder. Anyone who has been following the recent revival of this operation by Waters (1940) and by Ricci and Marr (1942) in the United States, must have been impressed by the perfection to which they, and a few others, have brought this most difficult operation; and

by the low maternal mortality associated with it in their hands. In our country only Lyle Cameron, as far as I know, has employed this type of operation to any extent.

Simpler possibly, but cruder in conception, is the lateral approach associated with the name of Latzko. In recent years Everard Williams tested it out, and with successes in a number of cases. But he informed me the other day that he had given it up. I doubt if we shall hear much

more of it in the future.

There is one point I wish to stress regarding the "lower segment" operation-it is the desirability of making the transverse incision as low as possible. In many cases I have actually made the incision across the expanded cervix and have confirmed this by a vaginal examination some days after operation. The scar in this area should be even stronger than one in the "lower segment"; although in my experience the scar in the latter area has proved adequate and almost immune to rupture. This question of the scar and rupture of it in a subsequent labour may not be of great importance if the operation in the first instance is performed for a decidedly contracted pelvis, as a repeat Caesarean section will be necessary. But it is of very great importance in border-line cases, for in them induction of premature labour might be all that is necessary in a subsequent pregnancy. And even more certainly does this apply if the operation is performed for preeclampsia or placenta praevia in a young primigravida—must she be condemned to Caesarean section in all her subsequent pregnancies? It does not reflect much credit on obstetric surgery if the answer is yes. I, personally, do not subscribe to the doctrine of "once a Caesarean always a Caesarean" and I trust you young obstetricians to prove by the perfection of your technique that you do not subscribe to it either.

Symphysiotomy. If I have not taxed · your patience too far I am going to close this lecture on a very controversial note. I tell you quite seriously that I am convinced there is a place for symphysiotomy in carefully selected cases of outlet deformity. What killed symphysiotomy, when it was revived in the "eighties" and "nineties" of last century, was that it was employed indiscriminately for all types of malformed pelvis from brim to outlet. It was not surprising, therefore, that injuries to bladder and urethra occurred in a considerable number of cases—in two of my early cases this happened (high forceps were used). Those who have had no experience of the operation—and very few indeed have employed it-imagine that impairment of locomotion from injury to the sacro-iliac joints is the danger and a common complication. This theoretical impairment of locomotion is an extremely rare sequela. I never witnessed it in any of my cases—not even in the patient who bolted from hospital with her baby on the 5th or 6th day after operation, and was found by my House Surgeon (who was sent post-haste after her) cooking her husband's dinner. Read the bibliography on symphysiotomy—you will find masses of it in the cellars of the Royal Society of of Medicine in French, German, Italian; and even in English, for Herman, Buist, myself, and a few others employed it—and judge for yourselves.

You will have observed that I stress the importance of employing the operation only in carefully selected cases of outlet deformity and the deformity should be pretty well confined to the transverse diameter. With any marked diminution of the antero-posterior you must go warily. Furthermore, I do not suggest it as a primary choice. It should be a procedure you hold in reserve in case the head is held up at the outlet more than you suspected.

Picture the conditions, 2 cm. of separation at the symphysis pubis (quite a moderate and safe separation) gives 2 cm. of gain in the transverse diameter and converts the arch of the pubis, which is so much talked about by radiologists, from Gothic to Norman. What more could be asked of an obstetrician than to make such an improvement in pelvic architecture! Study the writings of Thoms (1946), Chassar Moir (1946), Morris (1947), and others who have recently discussed the problem of outlet dystocia and you will realize how natural is the operation.

Dramatic is the operation of Caesarean section. But, if you have witnessed an operator making vain attempts to deliver the foetal head (visible at the pelvic outlet by separating the labia) and then seen him divide the symphysis and extract it with ease by means of forceps, you will be forced to admit that the operation of symphysiotomy is just as impressive. And it is so finished, so eminently suitable in the particular circumstances. It is finesse in operative obstetrics of the highest quality; and quality is the only thing that really counts.

And now I have come to the end of this commentary on border-line cases of disproportion-dystocia. I trust you young obstetricians will find the individual problems associated with it as interesting as I found them during the 50 years I was engaged in the teaching and the practice of obstetrics.

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## INSTITUTE OF OBSTETRICS AND GYNAECOLOGY

Queen Charlotte's Maternity Hospital and the Chelsea Hospital for Women have combined with the Postgraduate Medical School of London to form an Institute of Obstetrics and Gynaecology. Courses of instruction and training for advanced students will commence on 1st October, 1948. Requests for information and applications for enrolment, stating qualifications and previous experience, should be directed to the Secretary of the Institute, Postgraduate Medical School, Du Cane Road, London, W.12.

# PREGNANCY ASSOCIATED WITH A SEPTATE UTERUS, DOUBLE VAGINA AND OTHER CONGENITAL ABNORMALITIES

BY

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#### Introduction.

In the past few years a considerable number of cases of congenital abnormalities of the genital tract have been reported, and it is reasonable to suppose that minor degrees of maldevelopment are much commoner than is generally believed. It is also probable that certain abnormal occurrences in pregnancy and labour have their origin in unsuspected defects of the genital organs (Way, 1945).

Defects of the genital tract are not always obvious, and many women pass through their confinement without the midwife or doctor becoming aware of their presence. Even when the defect involves the external organs (for example, a vulvar opening of the anus) the condition may be overlooked, and many women reach adult life without suspecting that there is anything unusual in their anatomy.

## Types of Abnormality.

Genital tract defects vary from the faintest depression of the fundus of the uterus to complete absence of the genital organs. These defects may be described under three headings:

(I) Failure of fusion of the Müllerian ducts. Examples of this include uterus didelphys, uterus bicorpus bicollis, uterus bicorpus unicollis, uterus arcuatus. These are mentioned in order of decreasing severity of defect.

- (2) Failure of development of the Müllerian ducts. This results in absence of the uterus with or without absence of the vagina, in the so-called rudimentary horn of the bicorpus bicollis uterus, or the uterus unicorpus.
- (3) Persistence of the medial septum. According to whether this septum is complete or incomplete, it gives rise to a septate uterus and vagina, or to a subseptate uterus or septate vagina.

Anal defects arise from incomplete differentiation of the cloaca into the sinus urogenitalis and the rectum. The anus may be absent—the rectum will then be completely sealed off from the perineum—or the rectum may open into the posterior wall of the vagina, the bladder, or posterior part of the vulva, namely, the vulvovaginal anus. Not infrequently there is absence or deficiency of a sphincter around the ectopic anus.

Renal defects arise from agenesis of one, or part of one, urogenital fold. This results in absence of the kidney, the ovary, the Fallopian tube and half the uterus on that side. Fusion between two kidneys, forming the horse-shoe kidney, may be associated with a persistent uterine septum as in the case to be recorded.

The special object of this article is to draw attention to the fact that, when one abnormality exists, it is highly probable that others will be found, not only in the

urinary tract, which is so closely associated with the genital system in its development, but, at times, in other parts of the body.

Wharton (1925) states, "In practical application it means that a study of a patient with a malformation of either reproductive or urinary organs is fundamentally incomplete unless the investigation includes the whole genito-urinary system.... In their earlier development the Fallopian tubes, uterus and vagina are directly associated with the formation of the pelvis, the abdominal wall, the rectum, sigmoid, bladder and urethra. This conclusion, founded on embryological research, has been verified clinically by the frequency with which abnormalities of the uterus are associated with abdominal hernia, ectopic ovary, unusual proportions of the bony pelvis, exstrophy of the bladder, abnormalities of the rectum, sigmoid and anus, atresia ani, vulvovaginal anus and congenital fistulae due to incomplete development of the hollow viscus."

## INCIDENCE OF ABNORMALITIES.

Eismayer (1923) collected records of 122 cases of absence of one kidney associated with malformation of the uterus. Ballowitz (1895) studied 71 cases of similar renal abnormality and in 41 instances found malformation of the reproductive organs.

Regarding the frequency of uterine anomalies, Smith (1931) recorded that whereas only 16 cases were discovered in the general hospital records over a period of 26 years (1 in 7,040), no less than 19 cases (1 in 1,458) were observed by himself in careful examinations made over a period of 5½ years, showing in all probability that many cases passed unnoticed in the previous group. Pfleiderer (1929) recorded that, over a period of 20 years, 16 out of 91 cases of genital abnormality were of the uterus septus variety with double or single

vagina. Masson and Kaump (1937) recorded 17 cases discovered at necropsy among which were 4 examples of septate uterus and vagina. Taylor (1943) found that either complete or incomplete lack of fusion of the Müllerian ducts arises in about 1 in 1,500 cases reported from obstetrical wards and 1 in 2,000 from gynaecological wards.

Finally, in this country, Way (1945), reporting on 18,000 obstetrical admissions and 10,000 gynaecological admissions in Newcastle during 1938 to 1945, found 23 cases of uterine abnormality, one of which was of the uterus septus type.

# THE EFFECTS OF ABNORMALITIES OF THE GENITO-URINARY SYSTEM.

(a) In the pregnant woman. It is recorded by Way that in 32 pregnancies (a series of 12 patients with uterine anomalies) the following complications occurred: transverse lie 12; abortion 12; breech delivery 4; premature labour 3; retention of whole or part of the placenta 3; prolapse of the umbilical cord 2; placenta praevia 2. Falls (1939) reports that the incidence of postpartum haemorrhage is higher in cases. of uterus arcuatus than in those of normal uterine development. As well as these complications bleeding may occur from the nonpregnant portion of a double uterus during pregnancy, and is sometimes followed by the passing of the decidual cast. Uterine rupture, unfortunately, must be added to the list; it may occur in a rudimentary horn, or where there is undue thinning of the poorly developed myometrium, or because of obstructed labour associated with mal-According to Berkeley, presentation. Bonney and MacLeod (1938), twin pregnancy is slightly more than 7 times as common in the double uterus as it is in association with the normal uterus.

In the case of an abnormal kidney, pregnancy may light up an incipient pyelo-

nephritis (Everett, 1947) or glomerulonephritis. These dangers are surely of even greater import than many mechanical difficulties related to the uterus, which can be dealt with by careful observation and timely intervention.

It is possible that pre-eclampsia may also occur more frequently because of deficiency of renal function. Finally, the solitary ectopic kidney may be severely injured by the passage of the foetal head during labour, resulting in uraemia and the death of the mother.

(b) In the non-pregnant state. Dyspareunia sometimes occurs where a vaginal septum exists, or in the case of absent vagina when coitus may take place through an abnormally patulous urethra. Other symptoms include amenorrhoea, dysmenorrhoea, menorrhagia or other menstrual irregularity. Bainbridge (1924) states that in the uterus duplex menstruation may take place first from one organ and then from the other, the total loss being equivalent to the menstruum occurring at monthly intervals.

#### CASE HISTORY.

On 2nd January, 1948, an unmarried woman, aged 31 years, was referred by her doctor who wished to have a second opinion regarding treatment. He found that she was 16 weeks pregnant and, in view of the fact that she had bilateral congenital dislocation of the hips with gross pelvic contraction, he was anxious to know whether a termination of pregnancy should be considered.

The menarche occurred at 13 years; menstruation lasted 7 to 8 days, appearing every 28 days. It was regular but exceedingly heavy, necessitating the use of 60 pads each menstrual period.

Giving details of past history, the patient stated that, a few days after her birth, an operation was performed upon her because "there had been no bowel action." At the age of II she underwent an operation for the congenital dislocation of the hips (bilateral-angled osteotomy). This enabled her to walk more easily. No history of congenital

abnormalities in any other member of the family could be given.

#### On Examination.

The patient was a small woman, under 4 feet 8 inches, and walked with a typical waddling gait. In spite of 18 years of menorrhagia no sign of anaemia could be detected. There was evidence of some mental retardation. Albumin was present in the urine. The blood-pressure was 120/80.

On palpating the abdomen there was a cystic swelling in the mid-line equal in size to a 16 weeks' cyesis. On inspecting the vulva, a septum was visible at the introitus and on exploring with the finger it was found to divide the vagina into two lateral components. A softened cervix could be felt in each vaginal vault.

Arising from, and moving with, the right cervix was a cystic swelling. On the other side, connecting with the left cervix, was another smaller but firm irregular mass in a position postero-lateral to the cystic swelling. A diagnosis of double uterus was made, with a pregnancy in the right uterus and several small fibroids in the left uterus.

One further finding was of interest, namely, the absence of an anus. The rectum was found to open into the posterior part of the vulva. There was an excellent sphincteric muscle and the patient had perfect control of her motions. (Figure 1 shows the vaginal septum, the vulvo-vaginal anus and anal dimple, and Figure 2 shows a rubber tube in the vulvo-vaginal anus and the vaginal septum more fully exposed.)

In view of the albuminuria and the possible association of congenital anomalies of the genitourinary tract, it was decided to carry out an intravenous pyleography and, if possible, by means of hystero-salpingography to assess the type of double uterus.

## INVESTIGATIONS.

X-Ray reports were as follows: (I) A foetus of 4 months' maturity with a vertex presentation, (2) bilateral congenital dislocation of the hips (Fig. 3), (3) congenital deformity of both kidneys amounting to a horse-shoe kidney, the ureter absent on the right side.

Catheter specimen of urine: 100 mg.

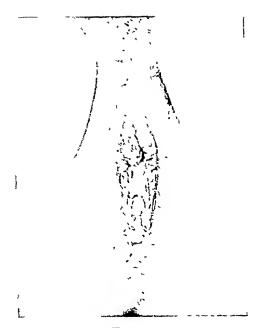


Fig. 1.

The vaginal septum, the vulvo-vaginal anus and anal dimple



Fig. 2.

The rubber tube in the vulvo-vaginal anus, and vaginal septum more fully exposed.

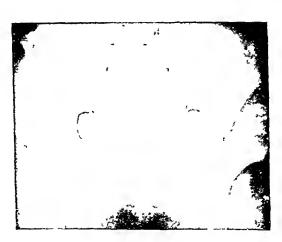


Fig 3
Bilateral congenital dislocation of the hips and contraction of the pelvic inlet.

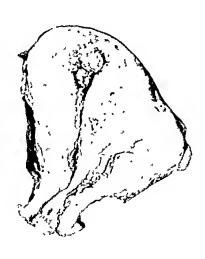


Fig. 4.
The uterus septus showing placental site.



protein. Blood urea: 38 mg. per 100 ml. Haemoglobin 109 per cent. Blood group: A, Rh negative.

It was decided to terminate pregnancy because of albuminuria appearing at an early stage of pregnancy and the probable impairment of renal function.

On discussing with the patient the additional complication of fibroids and the desirability of a further operation if it proved impractical to remove them at the time of hysterotomy, she expressed a desire to have the uterus removed and thereby be free of her distressing menorrhagia. She declared that she never wished to marry and have children. Indeed, hysterectomy appeared to be the most logical form of treatment.

On 14th January, 1948, at operation, the uterus, rather surprisingly, appeared to consist of one swelling, but it was soon found that a firmer portion on the left corresponded to the non-pregnant uterus and from this the right uterus was enlarged to form the cystic swelling. Small fibromyomata were dotted about the non-pregnant uterus, one or two being present in the other uterus. A hysterotomy was performed to confirm the presence of a septum, followed by a total hysterectomy. Both ovaries and Fallopian tubes appeared normal and were left in situ.

On exploration of the peritoneal cavity, the larger functioning portion of the kidney was found to be situated on the left side of the 3rd, 4th and 5th lumbar vertebrae. The smaller portion, representing one-third of the whole, was present at the level of the 4th and 5th lumbar vertebrae on the right side. There was no transposition of gut nor could a Meckel's diverticulum be detected.

No obvious congenital abnormalities were found in the foetus.

In Figure 4 the double uterus is shown: there are 2 uterine cavities and cervical canals and the placental site is in the right

uterus. The fibroids are not seen in this view of the specimen.

The patient made an uninterrupted recovery.

### DISCUSSION.

Here is a case of a woman with a septate uterus and vagina entering the 5th month of pregnancy without unusual symptoms. The presentation was a vertex and it seems likely, owing to the uterine septum, that the baby would have remained in this position. The placenta was situated on the fundus of the right uterus and not on the septum, so that risk of abortion was minimized. The signs which aroused suspicion of pelvic deformity were the small stature and characteristic limp.

The renal abnormality with impaired function was the point on which the whole treatment of the case rested, for congenital abnormalities of the kidney predispose to nephritis, formation of calculi and pyelonephritis and, according to Gutierrez (1933), this is particularly so in the condition of solitary kidney.

It is interesting to note that in this case, although only a small septum divided the uterus to produce 2 similar organs, yet the hypertrophy of the uterus containing the foetus and placenta quite overshadowed the hypertrophy brought about by hormonal influences in the other, where, although there was a well-formed decidua, the thickness of the wall was approximately half that of the pregnant organ.

The possibility that various developmental defects may co-exist is shown in this case by the abnormalities found in the pelvic girdle, rectum, kidney, ureter and uterus.

## SUMMARY.

(I) A short survey of the incidence of abnormalities of the genital and renal tracts is given.

(2) The possibility that these abnormalities may be combined is emphasized.

(3) A case is recorded in which the following abnormalities occurred in combination: (a) uterus septus and duplex vagina,

(b) horse-shoe kidney with one ureter,

(c) vulvo-vaginal anus, (d) bilateral congenital dislocation of the hips.

(4) In cases of malformation of the genital tract the importance of searching for anatomical abnormalities in the renal tract, and of assessing renal function, is stressed.

I wish to thank Dr. G. A. C. Summers for his kind help in providing the photographs.

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# A FURTHER CASE OF STROMAL ENDOMETRIOSIS

BY

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THERE have by now been described under a variety of names at least 35 examples of a diffuse type of new growth of the uterus in which the abnormally situated tissue bears a morphological resemblance to endometrial stroma.

Casler (1920) describes I case, with no aetiological designation but the descriptive title, "a unique, diffuse, uterine tumour".

Dougal (1926) describes I case as an "unusual, diffuse, uterine tumour", to be regarded as either a sarcoma or a benign tumour of the endometrial stroma.

Frank (1932) describes 3 cases under the title, "fibromyosis. An unclassified, plexiform, endolymphatic proliferation of the uterus". The resemblance of cell-type to that of endometrial stroma was noted with, in 1 of the cases, the microscopical diagnosis "adenomyoma without glands". Ewing (1940) quotes these cases and classifies them as "diffuse intravascular myomatosis", and comments that the growth was intramural and intrálymphatic as well as intravascular.

Goodall (1943) describes 14 cases, 12 of them as "chronic parietal stromatous endometriosis", the other 2 as "acute, parietal, stromatous endometriosis with restricted malignant characters". This author considers that the proliferating tissue is derived from the endometrial

stroma either by direct extension, or by lymphatic embolism, or by expansion from stromal cells pre-existing as a diffuse network throughout the whole of the myometrium.

Robertson, Hunter, Larson and Snyder (1942) describe 6 cases as "benign and malignant stromal endometriosis", also supporting the theory of development by direct extension from endometrial stroma.

Miller and Tennant (1944) describe 3 cases, "endometriosis interstitiale", with similar views on aetiology.

Henderson (1946) describes 7 cases under the title, "endolymphatic stromal myosis". This author agrees with Goodall that the tumours have their origin in endometrial stroma but concludes on grounds of clinical behaviour that the condition is an entity distinct from endometriosis. In a discussion on these 7 cases Novak stated that he was inclined to interpret them as representing low-grade sarcomas of endometrial origin.

One further case is here described:

#### CASE RECORD

A married woman aged 39 years, was admitted to Hairmyres Hospital, on 26th April, 1947. Her complaint was of pain in the right side of the abdomen for 1 year. The pain was described as a constant, dull ache, but on two separate occasions it had become more severe for short periods. The

pain was always located in the right iliac fossa and had never been accompanied by nausea or vomiting. Her general health had been good and she had not noticed any loss of weight.

Since the menarche at 14 years, the menstrual cycle had been 6 to 7 days every 25 to 28 days. The last period began on 12th April, 1947. There had been no intermenstrual bleeding. During the last year on several occasions the menstrual loss had been excessive. There had been no dysmenorrhoea.

She had borne 2 normal full-time children in 1931 and 1936. There had been no complications of pregnancy, delivery, or the puerperium.

Thyroidectomy had been performed 13 years previously. The patient was originally admitted to the surgical wards as a suspected case of chronic appendicitis, but on discovery of a mid-line, subumbilical swelling, she was transferred to the gynaecological ward.

The patient was a rather thin woman of medium build. On abdominal palpation there was a large firm symmetrical swelling in the mid-line extending from the pubes to just below the umbilicus. It was mobile from side to side. There was tenderness on deep palpation of the right iliac fossa. On vaginal examination the uterus was enlarged symmetrically to the size of a 4 months' pregnancy and was of a firm consistency. The cervix was firm and multiparous in character. There was some thickening and tenderness in the right fornix.

A diagnosis of a large intramural fibroid was made and operation decided upon.

On 30th April, 1947, the abdomen was opened by a right paramedian sub-umbilical incision. The uterus was symmetrically enlarged to the size of a 4 months' pregnancy. No individual fibromyomata could be seen or felt. The right ovary was slightly enlarged and several small follicular cysts were present. The left ovary and tube were normal. In the right broad ligament there were 2 tortuous, finger-like processes extending from the lateral margin of the uterus out towards the pelvic wall, The upper process was just below the ovarian vessels and did not quite reach the pelvic wall. The lower process was in the region of the uterine vessels and extended far out on to the pelvic wall, The left broad ligament was normal. During hysterectomy the upper process was removed completely along with the right Fallopian tube and ovary. An attempt was made to dissect out the lower process. Complete removal was impossible and it was therefore clamped and cut across. The uterine vessels could not be identified separately from the process and several greyish "worm-like" ends exuded from the cut surface. As surgery was incomplete in any event, supravaginal hysterectomy was performed, the left Fallopian tube and ovary being conserved. The appendix was retrocaecal and contained several faecoliths and, in view of the history of pain in the right iliac fossa, was removed. The abdomen was closed.

Convalescence was uneventful and the patient was discharged on 27th May, 1947.

A course of deep X-ray therapy was given at Glasgow Royal Infirmary, commencing 9th July, 1947, the details of which are as follows:

Two fields—anterior and posterior; 15 cm. Circle. Incident dose, 3,000 r units to skin. Total dose to skin, 3,510 r units. Minimal tumour dose, 2,760 r units, given over 3 weeks, 15 applications. Quantity of radiation: 200 K.U. 1 mm. Copper half-valve layer.

The woman was seen again on 14th January, 1948. Apart from some climacteric symptoms, she was in good health. On examination the cervical stump was healthy and there was no evidence of recurrence in the pelvis or abdomen.

MACROSCOPICAL DESCRIPTION OF ORGANS.

There were two specimens—one a supra-cervical uterus, the other an ovary with the outer 3 inches (7-5 cm.) of Fallopian tube attached.

The uterus had already been cut open but reconstitution showed that it was symmetrically enlarged and approximately the size of a 4 months' pregnant uterus. The peritoneal surface was smooth and free from adhesions. The already cut myometrial surface was not smooth. It was studded with a mass of small, dome-shaped protuberances 2 to 5 mm. in diameter consisting of smooth, firm, white tissue. These protruded through an irregular fibrous trabeculum and gave a comedo-like effect.

There was a conical mass lying in one broad ligament, 3 cm. deep opposite the cornu, tapering to end close to the cervical stump.

The ovary was oval in outline and enlarged, measuring 5 by 2.5 by 2 cm. Its outer surface was smooth but had a polycystic contour. The attached



Fig. 1.

Section through the endometrial cavity. × 1½.

(a) Polyp. (b) Tumour tissue.

W.W.P. & R.A.T.

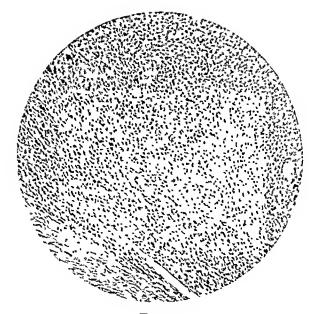


FIG. 2.

General appearance of most of the abnormal tissue—cellular, uniform, undifferentiated. × 100

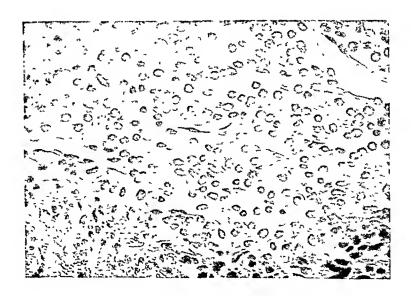


Fig. 2a. Higher magnification of the same area.  $\times 400$ .

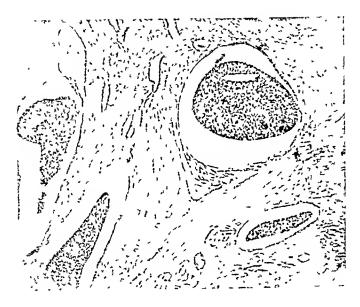


Fig. 3.

Tumour deposits in retracted tissue spaces giving the impression of lymphatic embolism, ×60.



Fig. 4. The faint beginnings of an arborescent pattern.  $\times$  100.

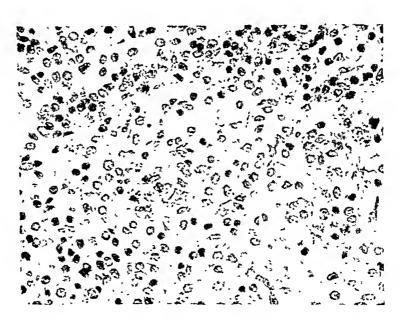


Fig. 4a.

Higher magnification of the same area showing cords of darker staining cells running across the upper part of the field. ×400.



Fig. 5. Well-marked arborescent pattern.  $\times 60$ .

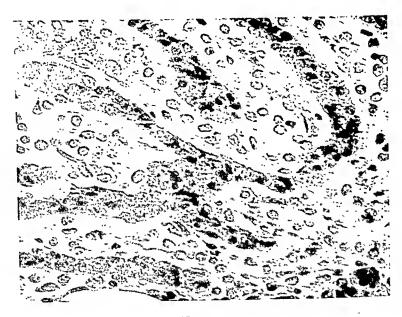
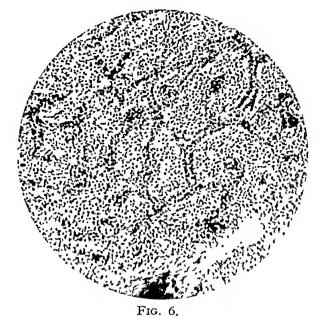


Fig. 5a. Higher magnification of the same area.  $\times$  500.



Canalization of several of the branches suggesting epitheliogenesis. × 100.

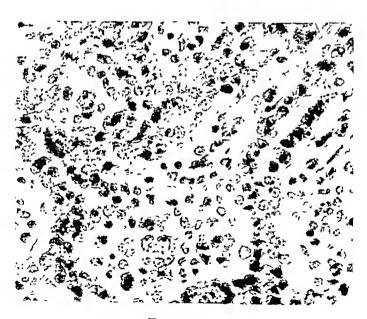


Fig. 6a. Higher magnification of the same area.  $\times 500$ .

length of Fallopian tube appeared normal. There was one narrow cord of firm, elastic tissue lying in the mesosalpinx parallel with the Fallopian tube

Additional facts found on further gross section were:

1. Bulk of uterus. The uterus was extensively permeated with deposits of an abnormal tissue.

The enlargement was seen to be only outwardly symmetrical. It was due to a greatly expanded posterior wall and fundus which curved forward over the cavity like a cowl. The anterior wall was represented by a small quadrantal block of tissue which contained one cord of the permeating tissue but was normal otherwise.

The recut surface appeared as an irregular mosaic of large and small islets of homogeneous white tissue partly fusing with each other but mostly separated by thick or thin trabeculae. Deep within the posterior wall was one cystic cavity the size of a walnut. It had a smooth lining; was largely occupied by a pedunculated mass of the firm white tissue; and had a content of clear, pale yellow fluid. Some of the larger islets were solid cords of tissue in cross-section in that they lay within smooth-lined tubes and showed clean separation from the walls on traction but most of them were closely blended with the interstitial strands.

Over much of the fundus the abnormal tissue was visible through the peritoneum. There were no recognisable fibroids anywhere in the specimen.

2. Uterine cavity. This was a slit-like space situated low down anteriorly, 6 cm. long by 3 cm. wide at its broadest part, with postero-superior and antero-inferior walls in close apposition.

On the posterior wall of the cavity was one small polyp flattened between the opposing surfaces. It appeared to extrude from the deeper tissue through a fenestration in the endometrium rather than arise from the endometrium itself. Elsewhere the endometrium had a normal naked-eye appearance. Its greatest depth at any point was 5 mm. (Fig. 1).

- 3. Broad ligament mass. The cut surface at first suggested a group of large lymph nodes, but further sections showed that the "nodes" were thick cords of the infiltrating tissue cut across.
- 4. Fallopian tube. This was 1 cm. in diameter, with a thick epithelium and of normal appearance. The cord of tissue in the mesosalpinx was 3 mm.

across, firm, translucent, and tapering to end near the fimbriae.

5. Ovary. Bisection showed one cystic space 2 cm. in diameter with thin, smooth walls and a clear fluid content; and three smaller cysts filled with gelatinous substance. The stroma was firm and uniform and did not contain any visible tumour tissue.

#### MICROSCOPICAL APPEARANCES.

Endometrium. Apart from a very occasional small focus of lymphocytes, the endometrium had a normal post-proliferative appearance. There was no adenomyosis. The polyp already mentioned showed marginal blending with the true endometrial stroma around its neck, and it had a covering of columnar epithelium. It did appear, however, to be formed by the extrusion of a cord of abnormal tissue growing upwards from the depths of the uterus.

Ovary. Simple follicular cysts were present; there was a normal cellular stroma and no evidence of new growth.

Abnormal tissue. Apart from an arborescent arrangement in some places (mentioned later) the cytological pattern was a flat field of entirely uniform, faintly eosinophilic cells. Owing to fusion the margins of the cells were not distinct but the nuclei were prominent. They were oval, measuring on an average  $8\mu$  by  $12\mu$ , and round in cross-section, with a finely granular chromatin content and clear nuclear membrane. Nucleoli were very few and not well formed, mitoses scanty and of normal type. The absence of polymorphism anywhere was striking. The growth appeared to be of completely undifferentiated stem-cell type (Figs. 2, 2a).

The tissue was only moderately vascular. It contained relatively few capillaries and only occasional thick-walled vessels of the type illustrated by Goodall (1940) and by Henderson (1946).

In some areas the tumour tissue lay within spaces with an endothelial lining (Fig. 3). No valves were seen in any of these spaces and we do not feel justified in calling them lymphatics. The appearance could be due to artefact retraction of ordinary tissue spaces which have been expanded by pressure of the permeating new growth; and they confirm the macroscopic appearances of cords of tissue lying in smooth-lined tubes.

In a number of places within the deposits of abnormal tissue there was a distinctive arborescent pattern (Figs. 4, 4a, 5, 5a). The cells which make up the branches stand out from the surrounding tissue by reason of a more pyknotic nucleus and a more basophilic cytoplasm. The pattern in general has an "epithelial" appearance (even if, in this instance, mesodermal epithelium), and in several areas there are branches which show canalization (Figs. 6, 6a). We consider that these features can justifiably be interpreted as attempted gland formation.

These branching cords bear a strong morphological resemblance to the primitive sex cords which arise in the developing gonad and which eventually form the rete ovarii. The Müllerian duct has its origin very close to the developing gonad and there may be aetiological significance in the appearance of this pattern in abnormal tissue in an organ so intimately related embryologically to the Müllerian duct.

### COMMENT.

Clinically the case resembles those previously described. The findings at operation were almost identical with those of the first case described by Goodall (1940). The finger-like processes in the broad ligament bore a strong resemblance to those shown in the photograph of the specimen in the first case described by Henderson (1946). The memory of this photograph enabled the operator to make a tentative diagnosis of the condition before the pathological findings were available.

These findings are very similar to those of cases reported by previous writers. An interesting addition is the canalization of some of the branches which make up the arborescent pattern. A similar pattern was noted by Dougal (1926) and by Goodall in one of his cases (1940, case 3, p. 20) but neither author reported canalization. If it is accepted that this finding can reasonably be interpreted as early epithelial gland formation, it establishes a closer identity of the abnormal tissue with endometrium

than has been possible so far, since in none of the previous cases has there been evidence of any epitheliogenesis in the permeating stromatous tissue. Identification of the constituent cells with endometrial stroma has so far had to be based on morphological appearances alone.

Yet this glanduliform differentiation does not constitute proof that the tumour tissue is derived directly from endometrium by invasion or embolism. There remains at least the possibility that the tumour tissue and endometrium have a common ancestor and that the process is a neoplasm proper having its origin in partly differentiating tissue of embryonic bipotency lying indiscriminately throughout the uterus, tissue which in the course of normal development becomes restricted in situation to the inner surface of the uterus, and in function to the formation of endometrial glands and stroma.

### SUMMARY.

- I. A further example of "stromal endometriosis" is reported.
- 2. Clinical and pathological features agree closely with those of cases reported by previous authors, with the addition of suggestive evidence of epitheliogenesis in the abnormal tissue.

We should like to take the opportunity of expressing our thanks to Dr. Johnstone, O.B.E., Superintendent, Hairmyres Hospital, for permission to publish the case; to Dr. Morrison of the Radio Therapy Department of the Glasgow Royal Infirmary, for the details of the deep X-ray therapy; to Lt.-Col. W. F. Harvey and Dr. James C. Lees for helpful comments during the preparation of this paper; and to Mr. Stanley Hay, Technical Supervisor at the Royal College of Physicians' Laboratory, for preparing the photographs.

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# ANGINA OF EFFORT IN PREGNANCY (Report of a Case)

BY

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Angina of effort during pregnancy is so rare that a report of a case in which this diagnosis could be made with reasonable certainty seems justified.

A woman, aged 37 years, was first referred to the writer on 1st November, 1945, because of precordial pain. She was then in the 3rd month of her 2nd pregnancy. An opinion was requested about the nature of the pain and the cardiac condition with special reference to a cardiac indication for terminating the pregnancy.

History. The patient's father died of a stroke at the age of 50; he was stated by the patient to have been very excitable and under treatment by "nerve specialists".

The patient had scarlet fever, diphtheria and otitis media at the age of  $1\frac{1}{2}$  years, measles and whooping cough later in childhood, severe tonsillitis with removal of one tonsil at the age of 24 and attacks of nausea and giddiness, diagnosed as vascular in origin, at the ages of 31 and 32. She had 1 healthy child, aged 8 years, with a normal pregnancy, terminated by Caesarean section for obstetrical reasons.

She had always been highly strung. When a child she was given to prolonged crying fits which were associated with a burning sensation in the chest. All her life she was prone to palpitation and partial deafness on emotional upsets. There was no history of loss of weight or undue perspiration.

Pain across both sides of the chest occurred for the first time at the age of 34 when carrying a heavy parcel; it lasted a few seconds and disappeared when she stopped walking. During the following 3 to 4 days pain came on also at complete rest, but improved after 3 weeks. Subsequently it was precipitated by walking uphill or against strong headwinds and by getting into a cold bed. In July and August 1945, while on holiday, she was able to go for long walks without pain, as long as her attention was distracted. Various diagnoses had been made regarding the chest pain, including angina pectoris, hyperthyroidism and neuro-circulatory asthenia.

## On Examination.

The woman gave the impression of being highly strung and excitable, and sighed frequently. The pupils were wide and the facial expression was somewhat staring, but there was no exophthalmos or any other sign of hyperthyroidism. There was slight fullness in the neck, but no obvious enlargement of the thyroid. Apart from a short systolic murmur over the apex and base and a slight accentuation of the 2nd pulmonary sound no abnormalities were found on routine physical examination. The bloodpressure was 145/85. Radiological examination of the chest, which included chest films in the postero-anterior and oblique views, showed the heart to be hyperactive;

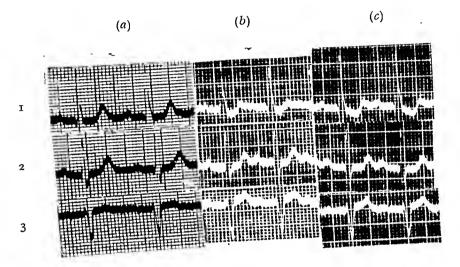
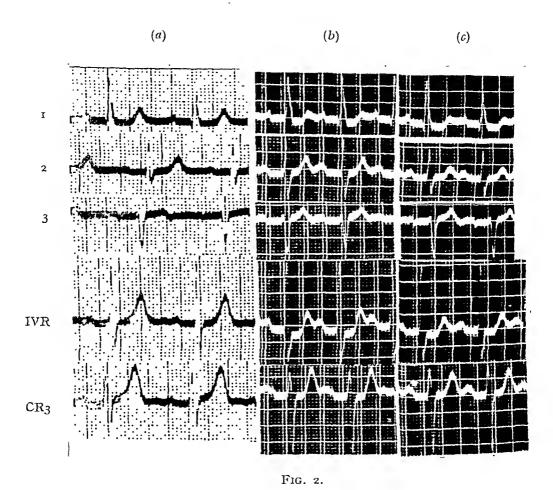


Fig. 1.

rst November, 1945. Patient 3 months pregnant. (a) before exercise; (b) and (c) 1 and 4 minutes respectively after the end of the exercise test. Time, 0.04 and 0.2 sec.

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16th June, 1947. About I year after confinement. (a) before exercise, (b) and (c) after exercise. (b) limb leads during the 2nd, chest leads during the 3rd min.;
(c) limb leads during the 4th, chest leads during the 5th min. after the end of the exercise test respectively. Time, 0.04 and 0.2 sec.

All tracings were taken with the same standard Cambridge electrocardiograph with interchangeable cameras.

no other abnormalities were found. A restelectrocardiogram showed ing rhythm, rate 81, left axis deviation, lengthening of the a-v and inter-ventricular conduction times (P-R: 0.22, QRS: 0.1 to o.11 second). There was slurring of the descending limbs of the R waves in lead I and of the S waves in leads 2 and 3. An exercise test, consisting of walking up and down 2 steps, each 9 inches high, showed diminution of exercise tolerance owing to the early onset of dyspnoea. Very slight pain in the chest occurred after 27 ascents carried out in 1 minute 40 seconds, but though the test was continued until 60 ascents had been carried out in 4 minutes the pain did not increase in severity and disappeared shortly after the end of the test. Subsequent electrocardiograms showed depression of the R-T junction of  $1\frac{1}{2}$  mm. below the isoelectric line, gross distortion of the R-T intervals and diphasic, mainly inverted T waves in lead I, distortion of the S-T intervals in lead 2 and increase in the height of the T waves in lead 3 (Fig. 1), these changes lasting over 7 minutes after the end of the test.

Such changes were clearly indicative of myocardial anoxia, but it was possible, though unlikely, that they were a result of the pregnancy. In view of the rarity of angina of effort in child-bearing women the diagnosis of coronary disease was left open for the time being and the patient allowed to continue the pregnancy under strict medical supervision. The presence of a large psychological element was obvious.

As the writer was unable to find any report on the result of such exercise tests with successive electrocardiograms in cases of pregnancy with normal hearts, 7 patients were examined by means of the same exercise test at Guy's Hospital; in none was there any evidence of heart disease and all were in approximately the same stage of pregnancy. Their ages were 24, 25, 27, 33,

39, 39, and 40 years. With the exception of one patient, in whom the number of ascents was also 60, all performed 100 ascents in times varying from 6 minutes 6 seconds to 7 minutes 41 seconds; none showed signs of temporary myocardial anoxia, but only an increase in rate. In only one case minor changes occurred in lead 1 in the height of the T waves and in the slope of the P-R intervals as well as depression of the S-T junction of 3 mm. below the isoelectric line.

The absence of signs of myocardial anoxia after exercise in pregnant women without any evidence of a cardiac lesion clearly supported a diagnosis of angina of effort in our patient. In order to substantiate it, re-examination several months after delivery was considered desirable.

Pregnancy continued to be uneventful and when seen a few days before delivery the patient had been able to carry out strenuous household duties without any discomfort. Except for changes in the position of the heart, due to the advanced pregnancy, the same findings were obtained on routine examination. A resting electrocardiogram differed from the previous one in that the T waves in lead I were slightly smaller and small Q and R' waves were present in leads 2 and IVR; they were attributable to the change in position of the heart.

For obstetrical reasons the patient was delivered by Caesarean section which she withstood well, discharged from the nursing-home on the 16th day she was able to resume her duties immediately afterwards without difficulty.

When last seen on 16th June, 1947, about I year after confinement, pain in the chest came on less frequently and was less severe than previously; it was precipitated mainly by exertion while stooping, but she was able to walk upstairs and out of doors without any discomfort. On examination no significant

changes were found. The blood-pressure was 150/90. A resting electrocardiogram showed the same features as on 1st November, 1945, except for a slightly lower heart rate (75). Another exercise test, in which she again carried out 60 ascents across the same 2-step device, but in 3 minutes 13 seconds (as compared with 4 minutes on the previous occasion) again produced temporary depression of the R-T junction of I mm. below the isoelectric line, gross distortion of the R-T intervals and diphasic T waves in lead I, and increase in the height of the T waves in lead 3; there was also depression of the S-T junction of 2 mm. below the isoelectric line and distortion of the S-T intervals in the apical chest lead IVR (Fig. 2). These signs of myocardial anoxia lasted 15 minutes after the end of Dyspnoea became noticeable the test. after 25 ascents carried out in just over one minute, but except for very slight transient pain in the left wrist after the end of the test no discomfort occurred and precordial pain was absent throughout. There was no evidence of anaemia (haemoglobin go per cent Autenrieth); the Wassermann and Kahn reactions were negative; the urine was normal.

# DISCUSSION.

While many different kinds of precordial pain are encountered in pregnant women, the number of cases in which a diagnosis of angina pectoris due to coronary disease can be made with any degree of certainty is exceedingly small. This is easily understood if the great rarity of coronary disease in women under 40 is remembered. In all age-groups considered together, the average ratio of male to female patients with coronary disease is about 4:1, whereas in a series of 100 patients under 40 the ratio was 24:1 (Glendy, Levine and White, 1937). Of the 4 women described by these authors

3 had hypertension and only I had a normal blood-pressure. The frequency with which cardiac neurosis was superimposed on the organic lesion was emphasized. This pronounced predominance of males with coronary disease in the under-forties is also borne out by Clawson's (1941) investigation on the incidence of types of heart disease among 30,265 autopsies: his figures for the 4th decade were 18 males with coronary sclerosis without hypertension in 2,052 autopsies as compared with I female in 1,283, giving the statistically significant difference of an incidence of 0.8 per 1,000 in females as compared with 8.8 per 1,000 in males.

The only condition at all which is known sometimes to cause true anginal pain in pregnancy is aortic regurgitation. Five such cases (4 of rheumatic and I of syphilitic origin) were found in the Boston Lying-in Hospital (Hamilton and Thompson, 1941), but in Hamilton's recent report (1947) from the cardiac clinic of this hospital for the first 25 years no mention is made of coronary disease amongst 1,335 pregnant patients with cardiac disease. Amongst 500 women with serious heart disease followed through pregnancy and delivery, only I with rheumatic aortic regurgitation and mitral stenosis developed angina from the 7th month, but no details are given (Carr and Hamilton, 1933). In Jones's series (1944) of over 1,000 cases of organic heart disease in pregnancy, no instance of angina of effort occurred. Bramwell and Longson (1938) state that they "have never met with angina pectoris in a woman who was pregnant." A possible case of angina of effort with congestive heart failure is Case 4 Offergeld (1931), most probably due to syphilis, as the Wassermann reaction was positive in the patient's blood and her father had died of syphilitic heart disease, but neither electrocardiograms nor a postmortem report was included in the paper (the patient died suddenly during her 2nd pregnancy). Other cases sometimes referred to as being examples of angina of effort in pregnancy cannot unreservedly be accepted as such, since the published data are inadequate (Budin, 1873; MacLennan, 1933; Tarnier quoted by Leyden, 1893).

Cases of angina of effort in pregnancy without aortic regurgitation, syphilis or any other systemic disease are even rarer. In the present case the changes in the resting electrocardiogram indicated a slight myocardial lesion, probably a remnant of one of the infectious illnesses which the patient had had in the past. The underlying condition most likely responsible for angina of effort and the electrocardiographic changes is coronary sclerosis and the family history of vascular disease tends to support this view. That coronary atheroma may occur in childbearing women, though rarely, is also shown by reports of cases of coronary occlusion in pregnancy (Maggini, 1913; White, Glendy and Gustafson, 1937). Other possible cases are the one of Reis and Frankenthal (1935), though the data given do not seem adequate, and a case of Jensen (1938); in the last case some of the symptoms and the electrocardiograms suggest pulmonary embolism as an alternative and perhaps more likely diagnosis.

### SUMMARY.

A case of angina pectoris of effort due to coronary sclerosis in a pregnant woman of 37 is described. The diagnosis of the anginal nature of the pain was based on its relation to effort and particularly on the electrocardiographic changes after exercise, which were indicative of temporary myocardial anoxia and which were found also one year after confinement. Such changes were absent in a group of 7 women

in the same stage of pregnancy, without evidence of any cardiac lesion, including 4 in the same age-group. The case also illustrated the value of serial electrocardiograms after exercise; the cardiographic changes indicating temporary myocardial anoxia were obvious as compared with slight and transient pain in the chest or the left wrist.

Grateful acknowledgement is made to Mr. A. J. McNair, Obstetric Surgeon to Guy's Hospital, for his kind permission to examine patients at his Out-patient's Department of the hospital, and to Mr. E. Marx, who was in charge of the patient during her pregnancy and delivery, for kindly giving me access to his notes.

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# HEART BLOCK AND PREGNANCY

(A Review)

BY

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NANTA (1914) described the first case of heart block associated with pregnancy in a woman of 28 suffering from congenital syphilis. Since that report 35 cases have been mentioned or reported in the literature. Many of these reports are brief and details are lacking. The purpose of the present paper is to review the published data with a view to finding indications regarding diagnosis, prognosis and treatment, dealing only with cases showing the higher grades of conduction defect.

The published cases have been divided into 2 groups; those due to acquired heart disease (Table I) and those due to congenital heart disease (Table II); each group will be discussed separately.

# ACQUIRED HEART BLOCK.

Hamilton (1947) in his recent survey from the Boston Lying-in Hospital gives the incidence of heart disease in pregnancy as 1.8 per cent; chronic rheumatic heart disease accounts for 93 per cent of the cases, congenital heart disease 5.2 per cent, and 1.8 per cent were made up of a miscellaneous group including syphilitic and thyroid heart disease.

Heart block is probably about twice as frequent in males as in females and about 90 per cent of the higher grades of permanent heart block occur after the age of 50 (White, 1944). It is, therefore, obvious that acquired heart block in women of childbearing age must be rare. Indeed Diddle

(1941) states that his case was the first observed among 14,000 obstetric admissions over a period of 14 years.

Sprague and White (1927) give the following causes for heart block in young people under 30 years: (1) acute infections (diphtheria, influenza, pneumonia, scarlet fever, typhoid and syphilis), (2) rheumatism, (3) congenital heart disease, (4) trauma, (5) idiopathic.

In the group of published cases 20 were due to acquired heart disease, their ages ranging from 20 to 38 years and the number of pregnancies ranging from I to 8. The block was complete in 14, partial in 1, both partial and complete in 2 and not definitely known in 3. It is seen from Table III that half the cases are due to rheumatic infection, a fact easily understood, having regard to the high proportion of pregnancy heart disease due to rheumatism. Other infections accounted for one-fifth of the cases and syphilis a tenth. Coronary artery disease and "myocarditis" accounted for a further 3 cases and Herskovics's (1931) case of abscess of the auriculo-ventricular node is unique.

The immediate maternal mortality for this group of acquired cases was 20 per cent, which is about the same as Hamilton's (1947) mortality for what he calls his unfavourable rheumatic cases. Two of the fatal cases occurred in patients with rheumatic heart disease and the other 2 cases suffered from coronary artery

TABLE I.
CASES OF ACQUIRED HEART BLOCK AND PREGNANCY

Case	Year	Author	Age	Para ·	Degree of Stock	Aetiology	Delivery	Result
I	1914	Nanta	28	1 & 2	Complete	Congenital syphilis	1. Normal 2. Abortion at 7 months	Mother normal children dead
2	1918	Freund	36	8	? Partial	Rheumatic	Abortion at 4 months	Died
3	1922	Walz	22	I	Complete	Infective	Normal	Normal
4	1923	Allespach and McDowell	22	ī	? Complete	Rheumatic	Normal	Normal
5	1927	Laubry ;	Young	?	Complete	Rheumatic		Normal
6	1927	Langley	? ~	I	? Complete	Rheumatic		Normal
7	1927	Dressler	30	I	Complete	Infection	Normal	
Ś	1927	Dressler	36	3	Complete	Myocarditis	Normal	Normal
9	1927	Naujoks	?	3	Complete	Rheumatic	Normal	Normal
1Ó	1928	Clerc and Levy	20	Ī	Partial and complete	Infection	Normal	Normal
11	1930	Hermann and King	3	6	Complete	? Rheumatic	Normal	Normal
12	1931	Bramwell	21	I	Partial	Rheumatic	Premature Normal	Died
13	1931	Herskovics	20	I	Complete	Abscess of A-V Bundle	Normal	Died
14	1931	McIlroy and Rendal	;	4	Complete	Myocarditis	Normal	Normal
	(1937)	(Naish)						
15	1933	Greenhill	3 <b>5</b>	I	Complete	Rheumatic	Caesarian	Normal
ιĞ	1936	Bernstein	23	I	Complete	Syphilis	Caesarian	Normal
17	1937	Sigler	27	2	Partial and complete	Infection	Normal	Normal
18	1939	Scholder	33	2	Complete	Rheumatic	Caesarian	Normal
19	1939	Ottow	38	2	Complete	Coronary artery disease	Forceps	Died
20	1941	Diddle	30	4	Complete	Rheumatic or syphilitic	Normal	Normal · (Died I year later)

disease and abscess of the auriculo-ventricular node respectively. It is impossible to state from the available data what effect pregnancy had on the course of the existing heart disease in the immediately favourable cases, but one case is known to have died from heart failure a year after parturition. No estimate can be made of the foetal mortality in these cases. Delivery does not appear to have given rise to any special problems (Table IV).

It would, therefore, appear that the presence of acquired heart block in a given case increases the danger of pregnancy, but it is the general cardiological state of the patient which is of most importance. The heart block is merely another physical sign indicating a certain pathology. All

aspects of each case must be assessed and advice given according to well-tried principles. I have no personal experience of cases in this group and many of the case reports are inadequate from a cardiological point of view, but it would appear that the mere presence of heart block in a case is not alone an indication for the termination of pregnancy.

A more detailed analysis of the symptomatology is given by Diddle (1941).

# CONGENITAL HEART BLOCK.

Morquio first described congenital heart block in 1901. Since then a large number of cases have been reported, mainly in children but few postmortem examinations have been carried out on proved

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TABLE II.
CASES OF CONGENITAL HEART BLOCK AND PREGNANCY

Case	Year	Author	Age	Para	Degree of Block	Type of lesion	Pulse rate	Condition during pregnancy and labour	Type of delivery	Result
ī	1927	Jeannin and Clerc	22	I	2:1	? IVSD	36-40	Dyspnoea	Caesarian	Normal
2	1927	Laubry	70	2	Complete	IVSD			Normal	Normal
3	1931	Titus and Stevens	25	I	Complete	? IVSD	44-76	No cardiac failure	Forceps	Normal
4	1931	McIlroy and Rendal	?	I	Complete	3 ĬA2D		No cardiac failur <del>e</del>	Forceps	Normal
5	(1937) 1933	(Naish) Taussig, Harvey and Follis (Lemann)	70	?	Complete	?		?	?	Normal
6	1938	Pigford (Jensen)	36	2	Complete	?	40-92	No cardiac failure	Spontaneous abortion 5 months	Normal
7	1941	Hamilton and Thomson	5	?	Complete			No cardiac failure	Normal	Normal
8	1941	Hamilton and Thomson	3	3	Complete	?	38	No cardiac failure ·	Normal	Normal
ō	1943	Mitchell, Fettes and Hollander		I	Complete	IVSD	62	No cardiac failure, Mild toxaemia & A.P.H.	Normal	Normal
10	1943	Jaleski and Morrison	31	1 & 2	Complete	IVSD	35-68	<ol> <li>Dyspnoea</li> <li>Normal</li> </ol>	Normal	Normal
11	1943	Yeprez	18	1	Complete	? IVSD	36	Normal	Normal	Normal
12	1946	Quintin	27	1 & 2	Complete	? IVSD	36-70	<ol> <li>Normal</li> <li>Normal</li> </ol>	Normal	Normal
13	1948	Mowbray and Bowley	27	I	Complete	ASD	42-50	Dyspnoea and palpitation	Normal Low Forceps	Normal
14	1948	Mowbray and Bowley	27	1 & 2	Complete	? IVSD	45	No cardiac failure	Normal	Normal
15	1948	Mowbray and Bowley	28	1	Complete	3	32-72	Toxaemia	Caesarian	Death

IVSD=Interventricular Septal Defect.

TABLE III.

Aetiology of Heart Block in Pregnancy

Acquired heart block		20
Rheumatic	•••	10 (Including Diddle's case)
Infective		4
Syphilitic		2
Myocarditis		2
Coronary disease		I
Abscess of A. V. node		I
Congenital heart block		15
I.S.V.D. definite		3
I.V.S.D. probable		6
A.S.D	•••	I
Unknown		5

ASD=Atrial Septal Defect.

clinical cases and fewer long-term followup investigations have been done. Campbell and Suzman (1934) reported 8 cases of congenital heart block and suggested that if such cases were followed they would be found in good health at a more advanced age. One of the authors (Campbell, 1943)

TABLE IV.

Deliveries and Maternal Mortality.

Normal or forceps Caesarean Abortion	Acquired 14 (1st delivery in Case: 3 2 (2nd delivery in Case	2
Not stated	2	Ĺ
Mortality	4	I,

carried out such an investigation on 7 cases and found them in good health between the ages of 22 and 42 years. Campbell also states that congenital complete heart block is not a rare condition but is often overlooked because of the relatively fast heart rate of 40 to 56 per minute. I agree with this statement and have seen 4 cases in under 2 years, 2 in women of child-bearing age.

The most frequent congenital cardiac lesion found in cases of congenital heart block is a patent interventricular septum. Heart block has also been described with pulmonary stenosis, aorto-pulmonary patency, dextro-cardia, atrial septal defect, complete transposition of the great vessels with septal defect, and in certain bizarre congenital abnormalities such as the case described by Yater (1929). It can also occur without other demonstrable congenital cardiac abnormality.

The more bizarre types of malformation associated with this condition are of little importance in relation to pregnancy as many of them do not reach maturity, or if they do the symptoms of cardiac disability preclude pregnancy. It is only cases unassociated with gross cardiac abnormalities that we are likely to see. Such cases are those with septal defects, or with no clinically demonstrable cardiac lesion other than the block.

The study of congenital heart disease in pregnancy does not appear to have been carried out in any great detail, probably due to its comparative infrequence, along with the tendency until recently of making a diagnosis of congenital heart disease and leaving it at that. Recent advances in therapy no longer justify this. The incidence of congenital heart disease amongst pregnant cardiacs varies between 1.83 per cent and 5.2 per cent (Mendelson and Pardee, 1941; Jensen, 1939; Hamilton, 1947). Jensen states that the expected

incidence of congenital heart disease is I in 5,000 deliveries of all types. It is, therefore, obvious that congenital heart block associated with pregnancy must be very rare. In a careful search through the literature I have found 12 cases mentioned by various authors or reported in more or less detail; to this group 3 further cases have recently been added, and these 15 are summarized in Table II.

If we disregard the 2 cases mentioned by Laubry (1927) and Lemann (1933) which were both seen in old age and had heart block which was thought to be congenital, then the age incidence where it is recorded is between 22 and 36 years, and the number of pregnancies varied from 1 to 3. Heart block was complete in all but one case (Jeannin and Clerc, 1927). In several of the recorded cases the congenital abnormality underlying the heart block was not diagnosed but where I have thought the described clinical signs warranted a diagnosis I have filled in this deficiency. On this basis 3 cases suffered from interventricular septal defect, 6 more probably had this defect, I had atrial septal defect, while 5 remain undiagnosed (Table III). Pulse rates during pregnancy and labour varied. from 35 to 92 beats per minute.

Symptoms and signs of cardiac deficiency are noteworthy by their absence; 3 cases had some dyspnoea on exertion but none showed signs of heart failure. Stokes-Adams attacks were infrequent and when they did occur were mild in character.

Delivery presented no unusual problems and the postpartum progress was normal in all but one case. Six patients had more than one pregnancy without untoward results, but there is no evidence to show whether pregnancy had any long-term adverse effect on the cardiac condition. Two cases were seen at the age of 70 years, one having had 2 children, which may suggest that pregnancy has no adverse effect on the

heart in these cases. The maternal mortality in this series was 6.7 per cent. There is insufficient data to state anything about the foetal mortality.

It would, therefore, appear from a study of the reported cases that congenital complete heart block with or without interventricular or interatrial septal defect does not contra-indicate pregnancy provided there are no signs of cardiac failure present before conception. When such cases are met with they should be treated according to the usual principles regarding pregnant cardiacs and allowed to go to term, being delivered normally or by low forceps, unless obstetric complications require other measures.

A further short comment is required regarding the single case in this group which died following delivery. This case did not show any signs of heart failure during pregnancy but developed toxaemia and hypertension towards the end of pregnancy which had an adverse effect on the pre-existing heart lesion, and, following Caesarean section, congestive cardiac failure occurred which eventually caused her death. Without this complication it seems probable that she would have gone to term and been delivered normally without untoward results.

The diagnosis of heart block either congenital or acquired may cause difficulty during pregnancy if the possibility of its occurrence is not remembered. Electrocardiographic examination is essential for an accurate diagnosis and all cases showing an unexplained bradycardia should be so examined. In cases of acquired heart block there will usually be signs of cardiac abnormality on physical examination, but in cases of congenital heart block there may be no signs and the heart rate may be relatively fast, which may cause a case to be overlooked; congenital cardiacs suspected of having an interven-

tricular septal defect or an atrial septal defect should always be electrocardiographed to exclude the presence of heart block.

The preceding account shows the importance from the prognostic point of view of making an accurate aetiological diagnosis. The prognosis in cases of congenital heart block and pregnancy is almost uniformly good unless complicated by toxaemia, while cases of acquired heart block carry a high maternal mortality and require considerable skill and judgment on the part of both obstetrician and physician if they are to terminate in a favourable manner.

## SUMMARY.

- 1. Thirty-five reported cases of heart block associated with pregnancy have been reviewed; 20 cases were due to acquired heart block and 15 were congenital.
- 2. The aetiological factors have been described.
- 3. The diagnosis, prognosis and mortality of both groups is discussed.

I wish to thank Professor F. J. Nattrass for his interest, advice and encouragement in the study of heart block during pregnancy.

I am grateful to Dr. Schade and Dr. Sarmiendo for having helped me with the translation of the German and Spanish papers.

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# CONGENITAL COMPLETE HEART BLOCK COMPLICATING PREGNANCY

(A Report of Three Cases)

BY

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Congenital complete heart block complicating pregnancy is a comparatively rare combination; it was first described by Jeannin and Clerc in 1927, and since then several further reports have appeared in the literature. Three examples of this condition are described here.

Case 1. A married primigravida, aged 27 years, was admitted to the Princess Mary Maternity Hospital on 1st July, 1947, for heart disease and bradycardia. She was about 36 weeks pregnant, with no past history of serious illness, and is the 4th member of a healthy family of 8. As a schoolgirl she suffered from breathlessness on exertion, and at 19 she had her first Stokes-Adams attack while hurrying to work. These attacks continued to occur at varying intervals and were often precipitated by over-exertion and rising in the morning, but occasionally they occurred at rest. She married at the age of 21 and in May 1946 was seen by Dr. Evan Bedford, who diagnosed atrial septal defect with complete heart block and mild cardiac failure.

During her pregnancy she complained of fatigue and palpitations and had spent part of each day resting in bed. There had been no cyanosis, cough, haemoptysis, oedema or Stokes-Adams attacks. After admission to hospital she was kept in bed and went into spontaneous labour on 1st August. Labour lasted 9 hours and ended with a low forceps

delivery of a normal male infant weighing 7 pounds. Her condition was excellent throughout and her heart-rate remained at 52 per minute. The puerperium was normal and the woman breast fed her infant until after discharge from hospital on 15th August.

Examination while in hospital showed her to be well nourished, normally developed and in good general condition without cyanosis or oedema. Her pulse rate varied between 40 and 64 beats per minute and she was afebrile throughout. The blood-pressure was 140/70. Jugular venous pulsations were easily seen and were about twice as frequent as the apex beat, which was situated in the 6th left interspace, 41/2 inches from the midline. There was a slow heaving impulse in the 2nd and 3rd left interspaces about 1 inch from the Percussion revealed considerable sternal border. cardiac enlargement both to the right and to the left. A systolic thrill was present at times in the right supraclavicular region and was constantly present over the left 2nd and 3rd interspaces, being maximal about 1 inch from the sternal border. A rough systolic murmur could be heard all over the praecordium and faintly in the interscapular region; this murmur was most intense over the left 2nd interspace close to the sternum, where a faint diastolic murmur could also be heard. At times a diastolic "noise" could be heard which was thought to be due to the auricular beat. There was no abnormal accentuation of the heart sounds.

The liver was neither enlarged nor tender and urinary output was satisfactory.

Examination of the other systems revealed no abnormality.

Urine analysis was normal. The Wassermann reaction was negative. Red blood cells were 5,080,000; haemoglobin was 98 per cent; colour index 0.96; white cells 13,400; and a blood film showed no abnormality.

Radiological examination carried out during the puerperium showed a generalized enlargement of the heart, with enlargement of the pulmonary artery and its branches. The right auricle was enlarged and displaced to the right. The aorta was hypoplastic, the lung fields were normal. These findings are in keeping with a diagnosis of atrial septal defect (Fig. 1).

Electrocardiograms taken on the 22nd July and 14th August show the presence of complete heart block with a ventricular rate of 43 to 50 per minute and an auricular rate of 100 to 120 per minute. The auricular waves are large and there is notching of the ventricular complexes in Lead 2 (Fig. 2).

The patient returned for re-examination on 19th December, 1947, when she stated that she was well, without breathlessness or other symptoms. Physical examination of the cardiovascular system showed no significant change from the previous examination. Screen and radiographic examination, however, revealed the general cardiac dimensions to be slightly larger, and an electrocardiogram was similar to those previously recorded.

CASE 2. A married primigravida, aged 27 years, was admitted to the Princess Mary Maternity Hospital on 3rd September, 1943, about 39 weeks pregnant. She had always been in good health and had taken a normal amount of exercise without symptoms. Her only previous illness was measles when a child. During pregnancy there had been no dyspnoea or palpitations, but during the 2 weeks prior to admission she had slight oedema of the feet. Because of the bradycardia, which was noticed at the antenatal clinic, the woman was referred in August 1943 to the Royal Victoria Infirmary, where a diagnosis of congenital heart block was made. After admission to hospital she was kept at rest in bed and went into spontaneous

labour on 13th September. Labour lasted 15 hours and ended in the normal delivery of a mature male infant weighing 7 pounds. The puerperium was normal. She breast fed her infant and was discharged on 25th September.

Examination while in hospital showed her to be a normally developed healthy woman. The heart rate was 46 beats per minute and regular; the blood-pressure 140/74. The apex beat was in the 5th left interspace, 4 inches from the mid-line, and percussion revealed no cardiac enlargement. On auscultation only a basal systolic murmur was heard. Examination of the other systems revealed no abnormality. The urine showed a persistent trace of albumin until delivery; the Wassermann reaction was negative.

Radiological examination carried out during pregnancy showed some enlargement of the left ventricle, otherwise the heart appeared normal.

An electrocardiogram taken during pregnancy shows the presence of complete heart block with an auricular rate of 120 per minute and a ventricular rate of 45 per minute. The P and T waves are large (Fig. 3).

This patient was re-admitted to hospital in labour on 6th March, 1945, at the end of her 2nd pregnancy, during which she had slight oedema of the feet but no other symptoms. Her blood-pressure had varied between 130/80 and 170/70 with a trace to 1 plus of albumin in the urine. Heart rate varied round 44 beats per minute and the physical signs in the cardiovascular system were the same as during her 1st pregnancy. After a normal labour she was delivered the same day of a mature female infant weighing 6 pounds 11 ounces. The puerperium was normal and she breast fed her infant, being discharged from hospital on 19th March.

Since her second pregnancy she has remained in good health, and physical examination reveals no change in her cardiac condition from that reported above.

Case 3. E. H., aged 28 years; married; primigravida.

This patient was admitted to the Jessop Hospital for Women, Sheffield, on 16 April, 1946, 31 weeks pregnant, suffering from toxaemia. She had spent 1 month in bed during her pregnancy following a threatened abortion during the 3rd month, but.

apart from this had been free of symptoms until just before admission. She gave a history of heart trouble since infancy and when II years old was diagnosed as a case of congenital heart block at Sheffield Royal Hospital. She had scarlet fever at the age of II and sciatica when she was 27. Between the ages of I3 and I8 she suffered from infrequent Stokes-Adams attacks, but from that time onwards was free from symptoms.

On admission her general condition was fair, she was pale and slightly cyanosed. There were no signs of congestive heart failure. The pulse was regular at 39 beats per minute. Blood-pressure was 170/80. The heart was enlarged to the left with the apex beat in the 6th space in the anterior axillary line, and a systolic murmur was heard all over the praecordium with maximum intensity at the apex.

Examination of the other systems revealed no abnormality.

Urine contained 0.45 per cent of albumin. Wassermann reaction was negative. Red-blood cells were 4,050,000. Haemoglobin was 70 per cent. Colour index 0.86.

Radiological examination showed the heart to be enlarged to the left with enlargement of the pulmonary artery and increased vascular markings in the lung fields (Fig. 4).

Electrocardiograms were taken on the 4th and 7th May, the first showed 4:1 heart block and the second complete dissociation between the auricles and ventricles. Auricular rates varied between 120 and 130, and ventricular rates between 32 and 40. There were no other significant abnormalities in the cardiograms (Fig. 5).

She was rested in bed but her condition did not improve, the toxaemia increased and her urinary output diminished while the blood-pressure rose to 190/68 and cyanosis increased. Her pulse-rate varied between 36 and 48 beats per minute, orthopnoea developed and albuminuria increased, but there was no oedema. On 5th May a Caesarean section and sterilization were performed under local anaesthesia, a premature live male infant being delivered. During the operation the patient had a Stokes-Adams attack. Following operation her condition temporarily improved but by the 14th May she was definitely worse. Her bloodpressure was 194/82, cyanosis was more obvious and there was increasing orthopnoea with signs of pulmonary congestion. The urinary output decreased, oedema developed and the liver became enlarged and tender. On the 20th she had a further Stokes-Adams attack, after which her pulse rate temporarily increased to 72 beats per minute. On the 23rd she discharged herself from hospital against medical advice and died 3 days later at home following 2 further Stokes-Adams attacks; no autopsy was obtained.

### Discussion.

Congenital heart block was described by Morquio in 1901, but it still does not seem to be realized that it is not an excessively rare condition in adults, and is one in which the prognosis is relatively good. Campbell (1943) stated that it is probably often overlooked because of the relatively fast heart rate of 40 to 56 beats per minute. Regarding its association with pregnancy, a careful search through the literature has revealed 12 cases mentioned by various authors or reported in more or less detail, which seems to show that its recognition is rare in the pregnant woman.

The most frequent associated anatomical defect is a patent interventricular septum, but heart block has also been described with pulmonary stenosis, aortopulmonary patency, dextrocardia, atrial septal defect and other more bizarre congenital abnormalities. It can also occur without other demonstrable cardiac lesion. We have been unable to find a case reported where congenital heart block and atrial septal defect complicated pregnancy as in our first case, where the physical signs, radiological and electrocardiographic changes fitted with the classical description of this condition. The second case was only diagnosed late in pregnancy after the bradycardia had been noticed at She had had no the antenatal clinic. previous symptoms of heart disease and was not aware of her condition. It seems probable that an interventricular defect was the associated anatomical abnormality in

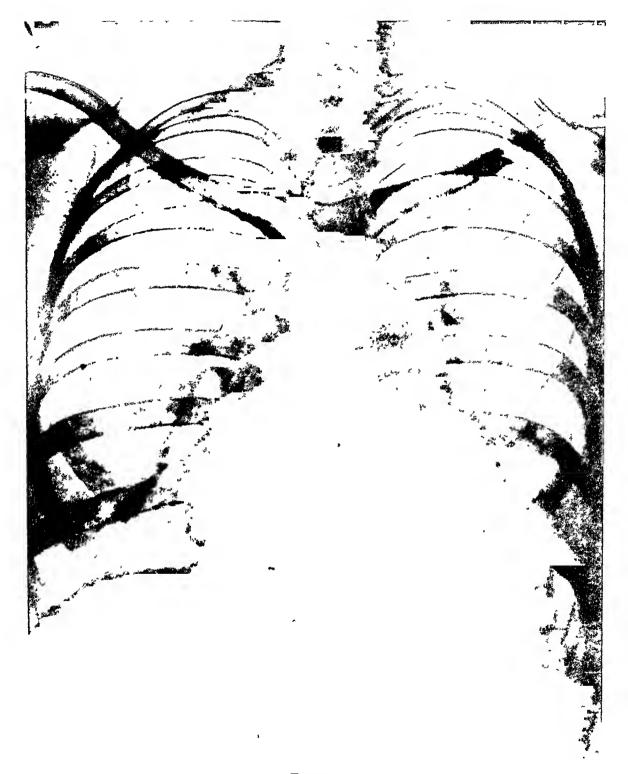


Fig. 1.

Case 1. Postero-anterior view of chest.

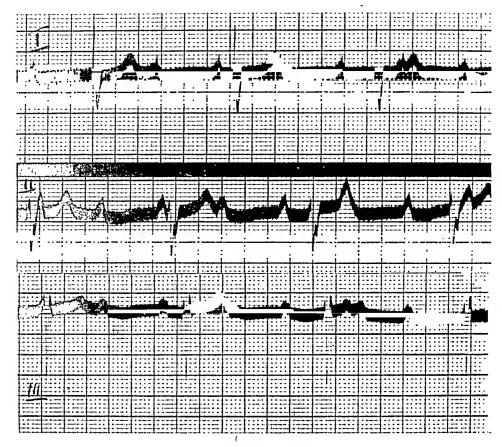


Fig. 2.

Case 1. Electrocardiogram.

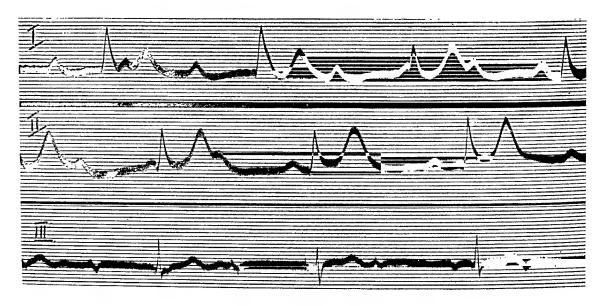


Fig. 3.

Case 2. Electrocardiogram.

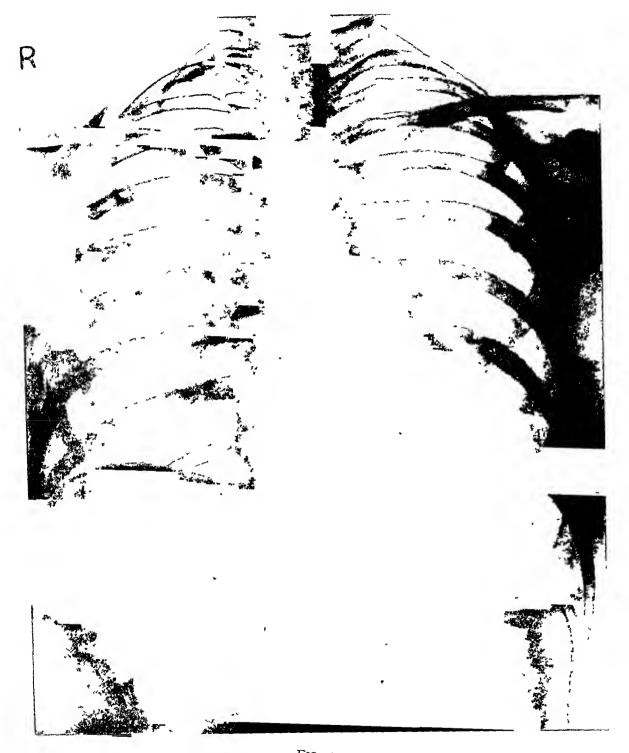


Fig 4

Case 3 Postero-anterior view of chest

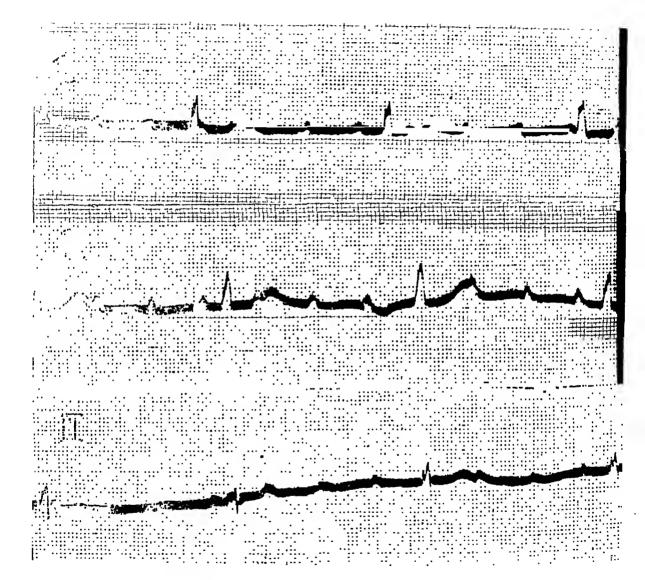


Fig. 5.

Case 3. Electrocardiogram.

her case. The third case was already known to be suffering from congenital heart block, but on the data available it is impossible to state what the underlying anatomical condition was. The first 2 cases showed ventricular rates over 40 per minute while the third case varied from 32 to 72 beats per minute following a Stokes-Adams seizure.

Stokes-Adams attacks in cases of congenital heart block are less common and less severe than in acquired heart block, In spite of their occurrence in our third case there is no indication that they are generally of a bad prognosis in cases such as those under consideration.

The third case illustrates the possible effect of a complicating toxaemia of pregnancy with hypertension on an already abnormal heart. There seems little doubt that in this case cardiac failure from which the patient died was precipitated, not primarily by the pregnancy, but by the

toxaemia and hypertension; if these had not ensued it is more than probable that the patient would have passed through a normal labour and survived. The second case also showed a mild degree of toxaemia in both her pregnancies which was insufficient in degree to affect adversely the cardiological condition.

## SUMMARY.

Three cases of congenital heart block complicating pregnancy are described and discussed.

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# THE VERNIX CASEOSA AND SUBNORMAL TEMPERATURE IN PREMATURE INFANTS

BY

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In spite of modern methods of nursing and incubation, including various forms of treatment, the problem of persistent subnormal temperature in the premature infant still remains to be completely solved.

We approached this difficulty in the National Maternity Hospital, Dublin, after the establishment of a modern incubator room with thermostatic control and added incubator equipment had not resulted in any marked success for some time. Thyroid gland was used but the results were not conclusive. A diarrhoeic effect was noted in most cases in which this latter treatment was administered and, in the case of the few infants that showed improvement, it was difficult to say whether this improvement was fortuitous or not. Oestrogenic preparations were tried both by mouth and parenterally with similar inconclusive and unsatisfactory results. The question then arose as to whether in the majority of cases this subnormal temperature was due to dysfunction of a poorly developed thermal centre, to a subnormal metabolism, to abnormal heat loss or to a combination of factors. We finally decided to investigate the prevention of abnormal heat loss.

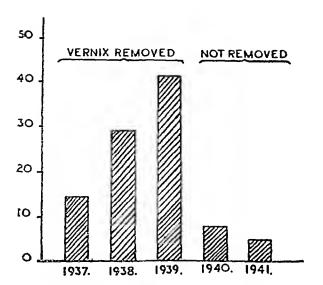
When the premature and thermo-labile

infant is deprived of its vernix after birth, it is left with a highly hyperaemic red skin surface which can possibly radiate considerably more heat than the infant can control with its poorly developed resources.

An experiment was made in which the vernix was not removed but was allowed to separate in a natural way. The procedure adopted was as follows: After birth, the cord was dressed and the baby, wrapped in heated blankets, was transferred to the incubator room, where it remained undisturbed for a couple of hours to allow for any condition of shock following delivery, the usual treatment being given when necessary. After this rest the baby was dressed and the vernix allowed to separate, which it did in most cases by the 5th day, except in the folds of the body such as the neck, groin, axilla, etc., where the separation was not complete until about the 10th day. It is interesting to note that these areas being rather hotter and moister than the rest of the body surface and consequently more liable to surface infection, were last to shed their vernix. After the natural separation of the vernix, there was little, if any, of the superficial hyperaemic condition invariably present following its

forcible removal and the skin showed good keratinisation which had taken place under the vernix.

An investigation into the results of this technique has shown a considerable reduction in the number of cases of subnormal



The actual figures were as follows:

Year	No. of infants	No. with subnormal temperature	Percentage
Vernix 1	removed		
1937	35	5	14.2
1938	24	7	29.1
1939	63	26	41.2
Vernix 1	not remove	- đ	
1940	68	5	7.3
1941	22	I	4.5

temperature since its introduction in 1940. The daily temperatures for the first 7 days of 212 infants under 5 pounds admitted to the infants department, without any case selection, have been noted for the years 1937-38-39-40 and 1941, and the numbers of infants showing persistent temperatures

below 97°F. ascertained for the whole of the first week. The foregoing chart shows the comparative incidence of subnormal temperature in the years before and after the adoption of this technique.

It would appear that the vernix caseosa, apart from being a protective covering to a skin possibly partially permeable to bacteria before keratinisation, may influence heat control, particularly in the premature infant, by the reduction of radiation from the underlying surface. surface with its very poor, or absent, adipose layer is covered by nature with a greater or lesser degree of vernix caseosa and if not stimulated by friction is partially protected by the vernix; on the other hand if this natural overcoat is removed and the efficiency of the poorly developed thermal control further strained by producing a hyperaemic body surface by the friction required, it is conceivable that the heat loss entailed is more than the poorly developed resources of the premature can cope with.

Subsequent to this investigation an interesting point has been raised by Lajos and Szontagh (1947), who produce evidence to show that the vernix probably contains substances which may be of benefit to the infant, notably oestrogen, which they demonstrated by producing full oestrus in infantile ovariectomized rats both by injection and inunction of vernix caseosa. As the latter route was also effective it would suggest that the skin of the newborn is also permeable to vernix. If so, the removal of the vernix may, apart from possibly increasing heat loss, perhaps deprive the infant of valuable intrinsic substances and also uncover a poorly keratinised skin surface that may on occasions, particularly in the areas described, be also permeable to bacteria. Whether fortuitous or not it is of interest to note that a considerable drop in the incidence of infection of unknown origin

has been observed since the introduction of this procedure, which is now routinely observed in both mature and premature infants.

It may also be recorded that no incubators have been used in the hospital since 1940, with no deleterious effect on the premature mortality. The routine methods of maintaining body temperature, apart from incubators have, of course, been observed.

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# THORACOPLASTY AND PREGNANCY—WITH SPECIAL REFERENCE TO CHILDBIRTH

(A Preliminary Report)

BY

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## INTRODUCTION.

In the campaign against pulmonary tuberculosis, modern measures of collapse therapy have played a prominent part. With sanatorium regimen, they have changed radically the management of patients with phthisis. Moreover, recent advances in the operative technique of thoracic surgery have helped to clarify not only the limitations but the various combinations of the many highly specialized methods of treating tuberculosis. result, these surgical procedures are now practised widely and extensively, with marked success, on the tuberculous female patient of childbearing age. In bilateral, as in unilateral, lesions they have given gratifying results.

This present investigation is concerned with the reciprocal relationships of pregnancy and thoracoplasty. Twelve tuberculous pregnant females are included in the study.

With one exception, their advanced cavernous lung lesions were treated by thoracoplasty prior to conception. All were delivered in Robroyston Hospital, Glasgow, during the period February 1947 to March 1948. Conclusions drawn are derived from a critical evaluation of available comparative clinical and radiological data, recorded before, during and after the onset of pregnancy.

## REVIEW OF THE LITERATURE.

References on the relations of thoracoplasty and pregnancy are not numerous. Careful search of medical literature by the author resulted in his finding only 31 such instances recorded. Alberts (1932), Jessen (1929), Hiebert and Hastings (1932), Haymaker (1934), Vannucci (1934), and Boquist, Simons and Myers (1935), are each credited with a single publication relating to pregnancy following thoracoplasty. Intervals between the operation and date of delivery reported by them varied from II months to 6 years. Busch (1930), Jessen (1932), followed next with 2, cases each. In Busch's cases the intervals were I and I years; and in Jessen's cases 7 months and 5 years. Seven examples of thoracoplasty following pregnancy were cited by Blisnjanskaja and Lasarevitch (1936). In their case reports thoracoplasty antedated the onset of pregnancy by periods varying from 2 to 4 years. Lastly Seeley, Siddall and Balzer (1940) published 10 cases of pregnancy following thoracoplasty. In only 6 of these did the pregnancy proceed to term. Once again the operation preceded the pregnancy by 2 to 4 years approximately. Quoting these same authors it is of interest to note that Sayé, Rist, Amorin, and Guillemin each reported I instance in which thoracoplasty was actually performed during pregnancy.

RESULTS OF TREATMENT.

The ages of the patients under discussion varied from 23 years to 32 years. There were 7 multiparous and 5 primiparous patients. A two-stage, seven-rib thoracoplasty was performed on each patient included in this study. With one excep-

tion, this operation was done on the left side of the chest. The interval between the thoracoplasty and the onset of pregnancy was variable. But for r patient who received this operation when she was  $3\frac{1}{2}$  months' pregnant, the interval varied from r to 10 years. Table I outlines the special

TABLE I.

	Name,		De	livery		Labo	our .	Infant weight	
No.	age, parity	Thoraco- plasty	Date	Туре	Dur Hr.	ation Min.	Compli- cations	at term (in kilos.)	Remarks
1.	I.H. age 28 Para. 3	1940	1947	Spontaneous	10	40	None	4.2	Nil.
2.	M.M. age 26 Para. 1	1942	1947	Spontaneous	4	o	None	2.8	Nil.
3∙	M.M. Age 23 Para 1	1942	1947	Low forceps	7	5	Uterine inertia	3.1	Nil.
4.	H.M. age 32 Para. 3	1947	1947	Low forceps	4	40	Slight dyspnoe	3.1 ea	Thoracoplasty done at 3½ months
5.	E.W. age 26 Para. 2	1946	1947	Spontaneous	13	45	None	2.6	Delivery 14 months after operation
6.	R.S. age 30 Para. 3	1941	1947	Spontaneous	18	0	None	3.6	Infant died
7.	I.B. age 27 Para. 2	1944	1947	Low forceps	26	35	Slight dyspnoe	3:4 ea	Slight exacerbation of lung lesion
8.	J.F. age 25 Para. 1	1943	1947	Low forceps	13	0	Uterine inertia	3.0	Nil.
9.	M.K. age 28 Para. 1	1943	1948	Low forceps	14	25	Uterine inertia	2.6	Nil.
10.	L.G. age 30 Para. 2	1946	, 1948	Spontaneous	I	40	None	3-7	Delivery 1½ years after operation
II.	A.G. age 29 Para. 1	1937	1947	Low forceps	11	40	Uterine inertia	3.7	Nil.
12.	A.W. age 26 Para. 3	1944	1947	Spontaneous	9	5	None	3.7	Nil.

features relating to the 12 patients under discussion. Complaints noted were: 2 with slight staining of the sputum during the first trimester, and I with acute rightsided pain, 14 days prior to delivery. In this latter patient pleurisy was diagnosed. The average duration of labour was 15 hours 15 minutes. The shortest time recorded was I hour 40 minutes, the longest 26 hours 35 minutes. Instrumental delivery was performed in 6 patients. The remainder were delivered spontaneously. Slight dyspnoea was observed in 2 patients towards the end of the 2nd stage of labour. The placenta in each instance was expelled complete and no excessive bleeding was reported. No puerperal sepsis occurred.

# DISCUSSION OF THE RESULTS.

Pari passu with the marked improvement in the operative technique of chest surgery, together with the recent advances in preventive medicine and in the practice of obstetrics during the past decade, a reorientation of views on the relations of pregnancy in the course of pulmonary tuberculosis has taken place. By and large, a more conservative approach has been made to meet the problem of pregnancy in the phthisical patient. Following this modern trend, a policy of non-intervention was practised in the 12 tuberculous patients included in this study. Radiological evidence confirmed adequacy of the anatomical collapse initiated by this operation. Notwithstanding the great strain imposed on the cardiac and respiratory functions in the first instance by thoracoplasty, and in the second by the gravid uterus, severe dyspnoea, as reported by Boquist et al. (1935), was not a striking feature in this series of patients. Respiratory embarrassment of moderate degree was observed in

one patient who developed pleurisy 14 days prior to delivery. In 2 others it was slightly manifest at the height of the voluntary expulsive efforts characteristic of the second stage of labour.

From observations recorded in this study distressing dyspnoea would seem to be largely hypothetical. Accordingly, per se, it should not justify therapeutic interruption of the pregnancy in patients with thoracoplasty. This is not in keeping with the view held by Jameson (1935). From observations, based on II case reports, he concluded that the respiratory embarrassment observed during labour in these patients was not a negligible hazard. On the contrary, it was more to be feared than exacerbation of the underlying lung lesion. Comparative chest radiograms during gestation, the immediate postpartum period, and after an interval of 3 months approximately following delivery, revealed evidence of pulmonary progression in only one instance. This latter patient, suffering from a right-sided pleurisy, failed to report for medical examination until she was almost at term. Consequently it is not inconceivable that the slight exacerbation of the lung lesion in this patient is not unrelated to her failure to attend for the allimportant prenatal care and supervision. Contrary to the reports of Seeley et al. (1940) prematurity was absent in this Infants were born at term. Recorded weights at birth varied from 2.6 kilogrammes to 4.2 kilogrammes. neonatal death, from gastro-enteritis, was reported within the first 3 months after delivery. No deaths have been recorded among the mothers.

Bearing in mind the fact that collapse therapy does not eradicate tuberculosis, but only creates favourable conditions which promote healing, advice regarding pregnancy in patients with thoracoplasty cannot be given without reservation. Sufficient time should elapse to ensure healing of the lesion before condoning pregnancy. Given a patient, however, with a tuberculous lung lesion adequately and anatomically collapsed by thoracoplasty, coexisting pregnancy, as shown by this study, need not necessarily be regarded as a severe imposition on the maternal organism.

#### SUMMARY.

Observations on the relations of pregnancy in 12 tuberculous patients with thoracoplasty are recorded. A review of relevant medical literature is also included. Deserving of special mention is the one case in which thoracoplasty was performed during pregnancy. Complaints during the gestational period were few, there being 2 with blood-stained sputum and one with pain in the right side chest. Respiratory embarrassment of slight degree was noted in 2 patients during labour. Deductions drawn from this small series of cases subscribe to the feasibility of pregnancy in the patient with thoracoplasty.

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# PREDIABETIC PREGNANCY

BY

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It has been recognized for some time that pregnancies in women who subsequently develop diabetes mellitus are associated with high foetal mortality-rates and large infants. Allen (1939) studied the obstetric records of patients having pregnancies complicated by diabetes and what he called a "benign type of glycosuria", and found that in pregnancies occurring long before the glycosuria became manifest there was a high incidence of large infants and an increased foetal mortality. He suggested that "glycosuria is only another or perhaps later manifestation of a condition that may produce larger babies and sometimes kills them before birth." Miller (1945a) showed, in women who developed diabetes in or during the fifth decade, that the average birth-weight and neonatal death-rate of infants born before the onset of the disease was greater than that for the control series. Herzstein and Dolger (1946) investigating the stillbirth-rate and neonatal mortalityrate over 20 years in a series of women who subsequently developed diabetes (prediabetic), found an increase in both in the 5 years period immediately before the disease appeared, but not in the preceding 15 years. The increased foetal mortalityrate among women who later developed

diabetes was apparently uninfluenced by the severity of the diabetes when it appeared.

In considering the aetiological factors concerned in the production of the large and vulnerable infant of the diabetic pregnancy it is obviously of great importance to establish whether these reports are typical of general experience. We have therefore examined the records of our diabetic patients from this point of view.

The group examined consisted of pregnant, diabetic women who had attended the Obstetric Unit of University College Hospital, and women who had attended or were attending the Diabetic Clinic of the hospital. As some authorities believe that the diabetes is of a different type in the menopausal and elderly patient, those women who developed the disease after the age of 45 were considered separately. Excluding these, there was a total of 43 patients who had had 90 pregnancies before the onset of diabetes.

FOETAL BIRTH-WEIGHTS.

The average birth-weight of 33 infants delivered of women in these prediabetic pregnancies was 3,607 g. ( $SD = \pm 191.8$ ).

The average birth-weight of a series of matched controls was 3,292 g. ( $SD = \pm$  112.8). Although the difference is not statistically significant, the figures lend support to the findings of Allen (1939) and Miller (1945a and 1946) that the infants of women in prediabetic pregnancies tend to be larger than normal.

## FOETAL MORTALITY.

The results of the 90 prediabetic pregnancies were: abortion, 12; intrauterine death of viable foetus, 10; neonatal death, 6; alive, 63 (including I pair of twins).

The rate of abortion was, therefore, approximately I in 8 pregnancies (13.3 per cent). This is comparable with the incidence of 12.3 per cent given by Herzstein and Dolger (1946) for 714 prediabetic pregnancies, of 14 per cent in a series of 50 pregnancies in women with established diabetes at the Obstetric Hospital, and II.8 per cent in a study of early non-diabetic pregnancies at the Obstetrical Hospital (Barns, 1947). The data showed that there was no significant difference in the abortion-rate in the prediabetic, diabetic and non-diabetic pregnancies.

The late total foetal mortality, consisting of stillbirths and neonatal deaths but excluding abortions, in this small series of 90 pregnancies was 16 in 78 pregnancies, an incidence of 20.5 per cent. This figure is a little higher than that of 15.4 per cent given by Herzstein and Dolger for the 5 years immediately preceding the onset of the diabetes. The late total foetal mortality rate for the 50 diabetic pregnancies already mentioned was 50 per cent. In 2,298 consecutive non-diabetic deliveries observed at the Obstetric Hospital between 1939 and 1941 the late total foetal mortality rate was 6.4 per cent. The rate for the prediabetic pregnancy was therefore lower than that for the diabetic pregnancy but higher than that for pregnancies in general,

findings which are in keeping with those of other published work.

Since the rate of abortion for such pregnancies was the same as for otherwise normal pregnancies, it follows that the high proportion of deaths among the foetuses and newborn in pregnancies before and after the onset of diabetes must be caused by some unknown factor or factors which affects the viable foetus in the later weeks of pregnancy.

It has already been mentioned that Herstein and Dolger found that the first 5year period before the onset of diabetes (prediabetic period) showed an increased stillbirth and neonatal-death rate, but that the preceding 15 years did not show such a tendency. The pregnancies were, therefore, investigated from this point of view. Table I shows the total late foetal mortalityrates for the pregnancies in 5-year intervals before the onset of the diabetes. As judged from this small series it would appear that the total late foetal mortality rate commences to increase above that for nondiabetic pregnancies 15 years before the onset of diabetes and continues to increase as the onset is approached. There is, of course, a gradual increase in the average age of the mother at the time of the pregnancy as the onset of the diabetes is approached. This is to be expected since diabetes is found to occur more commonly in the later part of the childbearing period (Barns, 1941). The difference in the average age of the mother at the time of the pregnancy for the various groups is, however, small and by itself cannot be considered to account for the great increase in the total foetal mortality-rate as the onset of diabetes is approached. To check this, the total foetal mortality-rate for prediabetic pregnancies, and pregnancies in general, according to the average age of the mother at the time of the pregnancy, in 5-year periods, were compared and shown

Table I.

Total Late Foetal Mortality Rate (excluding abortions) in Prediabetic Pregnancies.

Years before clinical onset of diabetes	Number of pregnancies	Number of stillbirths and neonatal deaths	Percentage total foetal mortality	Average age of mothers at time of pregnancy	Average age of mothers at time of pregnancy for group	S.D.
o-5	7 6 5 5 3 8	3 2 2 10 2 10 2 1	34-5	32.5 26.3 31.6 28.0 30.4	29.8	±5·37
6-io \( \begin{pmatrix} 6 \\ 7 \\ 8 \\ 9 \\ io \end{pmatrix}	4 ) 3   17 4 ) 3	1 o d	23.5	22.3 29.0 29.3 27.8 28.3	27.0	±4.46
11-15 (11	3 3 4 7 3		10.0	27.0 28.0 24.3 23.1 24.3	24 <b>.</b> 0	±3.98
15-20	9	0	o		22.8	±2.8
Over 20,	3	o	o	-	20.6	±1.25
Totals	78	16	20.5	_		

Table II.

Total Foetal Mortality Rates for Prediabetic Pregnancies and Pregnancies in General According to Average age of Mother at the Time of the pregnancy.

Average age of mother in 5-year periods	Number of prediabetic pregnancies	Total No. of foetal and neonatal deaths	Total foetal mortality rate (per cent)	Total foetal mortality rates for pregnancies in general (per cent) (D'Esopo and Marchetti, 1942)
Less than 19 years	4	0	0	3
20-24	28	3	10.7	2.5
25-29	24	7	29.2	3.5
30-34	15	2	13.3	4.0
35–39 More than	6	3	50	7.0
40 years	I	r	100	9.0
Totals	78	16	20.5	3.9

in Table II. The figures for the pregnancies in general are taken from a graph prepared by D'Esopo and Marchetti (1942), who investigated the foetal and neonatal deaths in 25,822 deliveries.

It is clear from the table that although the age of the mother does affect the total foetal mortality rate, it is not the main factor in the production of stillbirths and

neonatal deaths in prediabetic pregnancies.

The were 48 patients who developed diabetes after the age of 45 years and who had 183 pregnancies before the onset of diabetes. The results are shown in Table III. From the table it is seen that the abortion rate is less than one would expect for pregnancies in general. This is possibly explained by the fact that many of the

TABLE III.

Results of 180 Prediabetic Pregnancies Occurring in 47 Patients who Developed Diabetes after the age of 45 years.

Pregnancies occurring less than 20 years before onset of diabetes	Pregnancies occurring more than 20 years before onset of diabetes	Total
4	II	15 8.3
10.3	7.8	8.3
I	О	1
I	2	3
5·7 <sup>°</sup>	1.5	2.4
33	128	16.1
39	141	τ80
	occurring less than 20 years before onset of diabetes  4 10.3 1 1 5.7	occurring less than 20 years before onset of diabetes  4 10.3 7.8 1 0 1 2 5.7 1.5 33 128

women may have forgotten some of the abortions they had had. Especially is this so since the majority of the pregnancies occurred more than 20 years ago. The total late foetal mortality is also low. This may be due to the long time-interval between the pregnancy and the onset of the diabetes or to the possible difference in the type of diabetes which women over the age of 45 years develop. The number of prediabetic pregnancies occurring less than 20 years before the onset of the diabetes is too small to allow definite conclusions to be drawn but the figures suggest that the low foetal mortality rate is associated with the time factor rather than any difference in the type of diabetes.

# DISCUSSION.

The nature of the factor or factors responsible for the increased birth-weight, and the increased late foetal mortality in prediabetic pregnancies remains unknown. Presumably the primary factors are the same as those responsible for the similar results in diabetic pregnancies.

In the past it has been suggested that hyperglycaemia in the diabetic mother is responsible for the large baby. Clearly this cannot be responsible for the large infant of the prediabetic mother. Smith and Smith (1935a, 1935b, 1937 and 1940) have

reported hormonal changes consisting of raised serum gonadotrophin, diminished serum oestrogens and diminished pregnandiol excretion in patients with toxaemia of late pregnancy and eclampsia and state that these changes can be demonstrated 5 or 6 weeks before any signs or symptoms of toxaemia appear. White, Titus, Joslin, and Hunt (1939) suggested that the tendency to gigantism of the foetus of the pregnant diabetic might be related to a similar abnormal hormonal picture sometimes found in these women. The non-diabetic pregnant woman with toxaemia of late pregnancy does not have the large infant characteristic of the prediabetic and diabetic mother and it is therefore doubtful whether the size of the foetus is directly related to the abnormal hormonal picture.

Experimentally large foetuses have been produced by injecting the mother animal with extract of pregnant women's serum (Snyder, 1934; Hoopes and King, 1935). The large size of the foetus in these experiments was due to the prolongation of the pregnancy by the therapy. In the prediabetic and the diabetic the duration of the pregnancy is not usually increased and cannot account for the large foetus. Young (1945) has shown that repeated injections of anterior pituitary lobe diabetogenic extracts into puppies ultimately cause

diabetes. At first excessive growth occurs without producing diabetes. Once they become full grown further injections produce diabetes. Young was unable to separate the diabetogenic factor from the growth-promoting substance in his extract, so it seems possible that in the pregnant diabetic an excess of these hormones may be responsible for the large size of the foetus and also for the hypertrophy of the islets of Langerhans so frequently seen in these infants at postmortem examination (Gordon, 1935; Gray and Feemster, 1926; and Miller, 1945b). Further, the same pituitary overactivity could be responsible for the large infants of prediabetic women and the similar changes in the pancreas of such infants which have been observed by Miller (1945b). It is possible that continued overactivity of the pituitary in these women may be responsible for the eventual appearance of the diabetes as has been mentioned by other workers.

None of the hypotheses which have been put forward to explain the high foetal and neonatal mortality-rate of the diabetic pregnancy is wholly satisfactory. Coma, diabetic or hypoglycaemic, obviously cannot account for the intrauterine death of the viable foetus of the prediabetic mother.

Toxaemia of late pregnancy in the mother with its associated hormonal changes has been suggested by Smith, Smith and Hurwitz (1944) to be the cause of the high foetal mortality. The foetal mortality from late pregnancy toxaemia in non-diabetic pregnancies is approximately only half that from late pregnancy toxaemia in diabetic pregnancies (Barns, 1941). Intrauterine death of the viable foetus in a diabetic pregnancy has been observed without the association of late pregnancy toxaemia and conversely a successful outcome of a diabetic pregnancy has occurred in spite of the presence of toxaemia (Lawrence and

Oakley, 1942). It would, therefore, appear that this change in the hormonal levels in the serum is not the main factor in the high foetal mortality in diabetic pregnancies. Teel (1926) produced delay of implantation of the fertilized ovum in rats by daily injections of anterior pituitary lobe extract after mating and noted prolongation of gestation corresponding approximately with the delay of implantation. The foetuses reached maturity but invariably died in utero. Engle and Mermod (1928) made daily implants of anterior pituitary lobe in rats and mice, beginning at various stages of gestation. Interruption of pregnancy usually occurred with resorption or expulsion of a dead foetus, although animals in which the implantation was begun during the last third of pregnancy frequently produced normal litters born at term. This work suggests that anterior pituitary lobe secretion may be associated with intrauterine death of the foetus.

It does seem, therefore, that the anterior lobe of the pituitary may be the seat of factors which are associated with a large infant and high foetal mortality in the prediabetic and diabetic pregnancy and which may be responsible for the later development of diabetes in the prediabetic mother.

Clinically, White (1945, 1947) has obtained greatly improved results for the foetal mortality in diabetic pregnancies by using oestrogens and progesterone as replacement therapy to correct the imbalance previously mentioned above. Depression of the activity of the anterior pituitary lobe might also be a result of such therapy and the improved foetal mortalityrate might be due to suppressing the excretion of the above, suggested, lethal factor. Oestrogens alonė or androgens should prove equally effective and a clinical trial with these is now proceeding. Study of Young's extract on pregnant animals might give useful information on these points,

and experiments along these lines are being carried out.

# SUMMARY.

- (I) In confirmation of the work of other investigators it is shown that (a) the birth-weight of infants born of women who subsequently develop diabetes tends to be greater than normal and (b) the total foetal mortality-rate in such pregnancies is higher than is usual in non-diabetic pregnancies, and that this rate increases as the onset of diabetes is approached.
- (2) The abortion-rate in pregnancies before and after the onset of diabetes is not found to be significantly different from the normal.
- (3) In explanation of these findings the possible role of an overfunction of the anterior pituitary lobe in both the prediabetic and diabetic stages is discussed.

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# PNEUMO-PYOSALPINX

BY

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An unusual case of acute pyosalpinx was recently encountered in this hospital. Although the symptoms and the majority of the clinical signs pointed to a right-sided tubal infection, the finding of resonance over a tumour where dullness was expected raised interesting points of diagnosis. The subsequent operative discovery of a gasfilled tumour gave rise to speculation as to the cause of this rare condition, and is the chief reason for reporting this case.

Other collections of gas in the abdomen are described occasionally. Pathological pneumoperitoneum and pneumaturia have been noted as being of the more common conditions. Early descriptions of these diseases can be found in the works of Chiari (1893) and Senator (1891).

Although it would be expected that infection with the Clostridium group of organisms might explain the presence of gas, it is usual to find that the organism which predominates is the sugar-fermenting *Bacterium coli*, as in this case.

#### CASE RECORD.

A nullipara, aged 32 years, was admitted to this hospital as an emergency on 17th May, 1948, complaining of severe low abdominal pain, of sudden onset, for about 24 hours.

In August 1946 she had been admitted with a 3-day's history of acute appendicitis. At operation, through a muscle-cutting incision, a retrocaecal

appendix was found lying in an abscess cavity whose walls were formed by omentum, caecum and peritoneum. It was removed with difficulty. The abscess cavity was drained. Systemic penicillin was administered and recovery was uneventful. Culture of the pus produced a heavy growth of *Bact. coli*. No observations regarding the condition of the pelvic organs were recorded. She had no pelvic symptoms subsequent to operation until 24 hours before this admission.

Menarche at age of 15. Periods were regular every 28 days and lasted for 6 days; average loss; no dysmenorrhoea. There was amenorrhoea for 6 months following the appendisectomy and, since then, the cycle has been 1 or 2 days every 2 or 3 months. The last period was on 18th February, 1948.

About 24 hours before admission the woman felt sick and dizzy. She vomited once. About 1 hour later she developed lower abdominal pain, stabbing in character, which did not radiate, remained localized to the subumbilical area and increased in severity. Micturition was normal. She had no bowel movement in the previous 24 hours. She has had white, odourless vaginal discharge since appendisectomy, sometimes profuse, but in no way related to the periods; her general health had been good. Her weight had remained stationary. She had no cough. She has had occasional sexual intercourse. Examination on admission revealed: temperature 102°F.; pulse 116; respirations 22; blood-pressure, 120/80. The tongue was furred and rather dry; the teeth were carious; throat and tonsils were healthy. Respiratory, cardiovascular and central nervous systems were normal. The breasts were small and inactive.

The abdomen was distended below the umbilicus, and movement on respiration was restricted. There was exquisite tenderness and guarding of the lower abdomen, especially to the right above the pubes. This area was resonant to percussion. There was no renal tenderness. Pelvic examination revealed a cervix, firm, high up and displaced to the left. There was fullness and tenderness of the right anterior and posterior fornices but extreme tenderness prevented a satisfactory examination. The uterus was not outlined. A profuse greenish discharge, a little blood-stained, was found. The clinical picture was of an acute right pyosalpinx. The patient was treated with 200,000 units of penicillin 4-hourly, and a course of 32 g. of sulphatriad was commenced.

Blood sedimentation rate 80 mm. in I hour. Haemoglobin 87 per cent; white-cell count, 16,000 cells per cu. mm., 90 per cent were neutrophils. Wassermann, Kahn and the gonococcal fixation tests were all negative. Urethral, vaginal and cervical swabs produced profuse growths of Staphylococcus albus and Streptococcus faecalis. Urine obtained by catheter was sterile and did not contain albumin or sugar.

The patient's general condition quickly improved. The pain and tenderness gradually disappeared but the temperature continued to swing each night up to about 102°F. On 27th May, the white count had fallen to II,400 cells per c.mm. and the blood sedimentation rate had risen to 90 mm. fall in I hour. Physical examination now revealed a cystic swelling occupying the right upper pelvis and extending to just below the umbilicus. The cyst was softer than when first seen and nearly all the tenderness had subsided. The tumour had a diameter of about 6 inches (15 cm.) and was fixed. It was resonant to percussion. This resonance was considered due to overlying bowel. The uterus could not be demarcated. There was no longer any vaginal discharge. In view of persistent pyrexia and failure of the tumour to involute, it was decided to carry out examination under anaesthesia.

On examination the findings were as before. A needle was inserted into the cyst through the posterior fornix and a quantity of thick pus was aspirated. A posterior colpotomy was carried out and a little serous fluid was obtained. On these findings it was decided to carry out a laparotomy.

The abdomen was opened through a midline subumbilical incision. The omentum was found lightly adherent to a cyst which was resonant to percussion. Adhesions were separated digitally from the cyst, a normal sized uterus and bowel. The tumour, now in the main free, except for a small area superiorly which was firmly adherent to bowel, was elevated through the abdominal opening. The cyst was 6 inches (15 cm.) in diameter and contained two-thirds gas and one-third pus, the fluid level being clearly seen. As the mass was being separated from the intestine it unfortunately The pedicle was clamped, tied and ruptured. divided. The tumour was removed. There was some general venous oozing from the raw surfaces and this was controlled by application of Alginate gauze. The abdomen was closed without a drain. The patient was shocked on completion of the operation. Intravenous drip was commenced. One pint of dextrose and one pint of Group O, Rh-negative blood were given. A prophylactic injection of 24,000 units of anti-gas-gangrene serum was given. A course of 30 g. of sulphathiazole was commenced and the penicillin was continued. Recovery was satisfactory except for a sinus communicating with the peritoneal cavity and the lower end of the abdominal wound. Through this was passed, between the 10th and 16th days, quantities of Alginate gauze. This gauze is normally absorbed in 5 days but presumably sepsis prevented this. Subsequent recovery was uneventful.

Culture of the 'pus aspirated from the cyst showed a moderate growth of coliform bacilli, resistant to penicillin, but no Clostridium welchii. A swab of the pus from the discharging sinus grew lactose-fermenting coliform bacilli, Staphylococcus albus and Streptococcus faecalis. These organisms were consistent with the presence of a faecal fistula. However, microscopy of the discharge did not reveal any faecal debris. Two further investigations were carried out prior to discharge. The fasting blood sugar was 97 mg. and a glucose tolerance curve was quite within normal limits. Finally a barium series was carried out in an attempt to demonstrate any evidence of a fistula or bowel damage, but none was found.

The specimen was an ovoid, ruptured, cystic mass measuring 100 by 75 by 50 mm.; the ruptured area being the thinnest part. The cyst was formed by

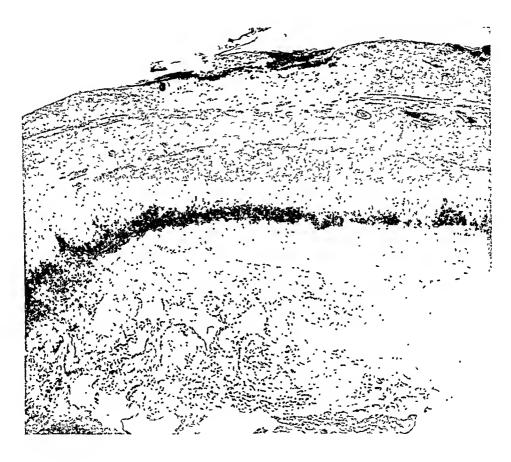


Fig. 1.

Low power ( $\times$ 8) of the cyst wall. Note loss of lining mucosa and replacement by a thick layer of fibrinous inflammatory exudate.

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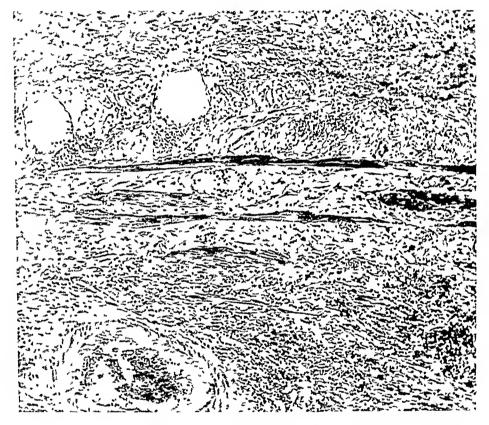


Fig 2

Higher power (  $\times\,85)$  of a section of the wall to show muscle-tissue  $\,$  Chronic and active inflammatory cells can be seen

R W K P. & J Y.

the distended Fallopian tube and varied in thickness up to 15 mm. The ovary formed an hemispherical mass attached to the main cyst. The cyst was lined by a shaggy layer of fibrin. The ovary appeared to be fibrosed and contained a brown, haemorrhagic corpus luteum.

In sections of the wall of the cyst the muscular coat of the Fallopian tube was still visible (see Figs. 1 and 2) but the wall was thickened by an inflammatory exudate in which polymorphonuclears were the dominant cells. The lining epithelium had been destroyed and the cyst was lined by a mainly fibrinous inflammatory exudate. In addition to the active inflammatory exudate there was evidence of an older process in the form of a fibroblastic and angioblastic proliferation. The ovary was bound to the Fallopian tube by fibroblastic proliferation and there was some spread of the inflammatory process from the Fallopian tube into the ovary. Sections were stained for bacteria but these could not be found.

(The apparent discrepancy in the size of the tumour was considered due to shrinkage of the cyst following fixation.)

# DISCUSSION.

There seemed no doubt that the tumour was a pyosalpinx which had undergone a sudden enlargement, presumably following a reinfection and introduction of gas. was probable that the right Fallopian tube had been involved in the infective process following the appendix abscess in 1946 and a chronic asymptomatic pyosalpinx had resulted. It was reasonable to suppose that the severity of the pain was due to a sudden distension of the cyst by gas rather than by the lighting up of the old tubal infection. It was noted prior to operation that the pain subsided coincidentally with a lessening of tension of the cyst without subsidence of the pyrexia.

The chief problem to be explained was the presence of gas in such a cyst. An extensive search of the literature does not reveal a similar occurrence. Three possibilities are open for consideration: (1) The pain may have been due to the infection and distension of the cyst by pus and this subsided as the effect of the antibiotics developed. The temperature did not fall and this, unless due to the continued use of chemotherapy, indicated a continuance of the infection. The gas may have been introduced during the procedures following the examination under anaesthesia. This was not likely, as the technique employed was such as to obviate any introduction of air. Further resonance of the tumour was demonstrated prior to operation.

(2) The gas may have been formed from an organism of the gas gangrene or lactosefermenting coliform groups. No evidence at all was available to support the presence of the organisms of gas gangrene and cultures failed to demonstrate this type of bacteria. If such organisms were responsible for the sudden formation of gas they must be presumed to have entered from the gut or been introduced during a procedure designed to procure a miscarriage. The patient did not consider she was pregnant. Consideration of the gas-forming coliform group, however, opened up a more promising field. This was the chief organism cultured in the cyst and from the discharging wound sinus. Nevertheless, the amount of gas formed by this organism is extremely unlikely to cause sudden distension of this type of tumour. Under certain circumstances Bact. coli produces more gas than usual and that is in the presence of a suitable sugar medium. Several cases are recorded of perirenal and intrarenal gas formations due to this organism (Gillies and Flocks, 1941). The more common condition of pneumaturia was recognized as early as the late nineteenth century by Chiari in 1893 in association with diabetes. Riley and Bragdon (1937) had collected over 200 cases from the literature. The gas follows the decomposition of the sugar containing urine, in the bladder or renal tissues, by the Bact. coli. Gillies (1941) also

described cases of interstitial emphysema in diabetics suffering from *Bact. coli* infection. These cases closely resembled a true gas gangrene infection. Investigation of this patient did not reveal any diabetic tendency.

Salpingo-intestinal fistula. This seemed to form the basis of a more satisfactory explanation. Occasionally a pyosalpinx may rupture into the peritoneal cavity or perforate into an adjacent viscus. Martz and Foote (1936) review the literature and found 238 cases of spontaneous rupture of a pyosalpinx. Norris in 1913 states: "rupture or perforation of an adherent pyosalpinx into the rectum is not infrequent and into the bladder or upper intestine is more rare." Tubo-vesical fistulae are described in a paper by Martin Croce (1947) and Le Picard (1939). described a case of a salpingo-colic fistula complicating a pyosalpinx. He observed that recent literature failed to reveal such a fistula above the rectum. He demonstrated his case by X-rays and at operation. Therefore even small bowel-tubal fistulae are not outside the bounds of possibility. Pneumoperitoneum is a well-recognized entity and is usually due to a valvular opening in the intestinal track from ulceration, abscess, fistula, or injury. It might be postulated, therefore, that as a result of a chronic infective process, with necrosis of the bowel wall, a small fistula developed between the intestine and the tube at the site of the densest adhesions, and that gas and organisms were able to pass through, thus producing acute distension of the fairly thin-walled cyst and reinfection by the Bact. coli. It can be argued in support that the organisms found in the cervical and vaginal swabs taken on admission were similar to those found in a faecal fistula. This implies drainage of the pyosalpinx,

possibly as the result of increased tension, through the uferine cavity. Further, these same organisms were cultured from the pus of the discharging sinus. If this was correct the fistula might have existed after the operation, though too small to note at laparotomy, and gradually closed during early convalescence. Against this, however, is the absence of any faecal debris or intestinal cells on microscopy of the discharge from the sinus and the negative X-ray findings.

### SUMMARY.

A case of pneumo-pyosalpinx has been described.

Possible causes of this unusual condition have been discussed but no definite conclusions as to the cause of the gas in the cyst have been possible on the available evidence. The main weight of evidence seems to point to a fistulous source.

We are indebted to Dr. Harrison and to Dr. Doniach for the pathological details, and to Mr. E. V. Willmot, A.R.P.S., for the photomicrographs.

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# SPINA BIFIDA OCCULTA AND NULLIPAROUS PROLAPSE\*

(With Notes on the Incidence of Certain Abnormalities of the Sacrum)

BY

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THE observations on which this paper are based were originally planned to provide an answer to the question: Is there any relation between spina bifida occulta and nulliparous prolapse? The discussion of this question forms the main part of the paper.

Further examination of the abnormalities of the sacrum which were encountered suggested that their incidence might usefully be compared with those reported by other authors because of their possible bearing on the subject of caudal anaesthesia.

Genital prolapse is a condition we are accustomed to accept as the outcome of trauma by childbirth to the structures which support the pelvic organs. The condition does, however, occur occasionally in women who have not borne children and the question then arises why the supporting structures have proved inadequate in these cases.

This is the group of cases variously called congenital or virginal or nulliparous prolapse. We prefer the term nulliparous True congenital prolapse has been seen in babies a few days old. About a score of such cases have been described and were reviewed by Ballantyne (1902) and by Ebeler and Duncker (1915). In all except two of these cases the child also had a lumbosacral spina bifida which ultimately led to its death. Careful postmortem examination of the pelvic floor muscles in Ebeler and Duncker's case showed them to be very thin and heavily mixed with fat compared with those of other children of the same age.

This knowledge has led others before us to consider whether lesser defects of the posterior arches, which might possibly involve the fibres of the 4th and 5th sacral nerves, could be associated with a weak pelvic floor. Given a weak pelvic floor then the ordinary bodily stresses and strains could produce that type of hernia which we recognize as prolapse.

Such defects of development of the posterior arches are clinically referred to as

because the condition occurs in childless women whether they are married or not and as, in these women, the prolapse is not present from birth it is not correctly described as congenital, although it may be that the cause of the failure of the supporting structure has been present from birth.

<sup>\*</sup>Read at the Section of Obstetrics and Gynaccology of the Royal Society of Medicine on 19th March, 1948.

spina bifida occulta. All cases of spina bifida occulta are not accompanied by external physical signs. For instance cases have been recorded of patients suffering from defects of bladder control where a spina bifida occulta has been demonstrated only by radiography and the patients were cured by operative freeing of fibrous bands which were interfering with the nerve fibres in the area of the defect.

Ebeler and Duncker examined 28 women with prolapse by X-rays and found spina bifida occulta in 23 and no spina bifida occulta in 5. The article does not state definitely whether these were nulliparous or parous women. They also examined 28 multiparae (somewhat older) with no prolapse; only 3 of these showed spina bifida occulta.

Thaler (1916) states that, in 50 women who were proved by X-ray examination to have spina bifida occulta in the sacral region, 25 had prolapse and 25 had not. Again the parity of the patients is not stated.

Graff (1923) divides patients suffering from prolapse into 4 groups, the first 2 of which are germane to this discussion. These groups are described by him thus:

"I. Prolapse in virgins and nulliparae, often associated with growths and spina bifida.

"2. Women who develop prolapse after their first natural delivery. In these cases spina bifida occulta is often to be found. In both these groups the patients are women with particularly inferior tissues."

Heynemann (1924) investigated 20 patients suffering from prolapse by X-rays and only found I who showed a spina-bifida occulta. He goes on to say "the diagnosis of spina bifida occulta by X-rays can only be made when a fissure can be shown in the region of the lumbar spine (usually about L5, or in the upper portion of the sacrum). The mere presence of an enlargement of the sacral hiatus upwards to S4, 3, or near 2 is

not sufficient for the diagnosis." Heynemann evidently had access to Ebeler's material for he says "Amongst his positive cases Ebeler has at least 5 and possibly 8 cases of enlarged hiatus. If these are considered his figures for positive cases are reduced to 15."

The following appears in Veit and Stoeckel's (1927) handbook. "In cases of prolapse in virginal and nulliparous women a spina bifida occulta is occasionally seen; according to Gräsner in about ro per cent, but in these there is not complete paralysis but paresis or at least a lack of tone and capacity for contraction in the muscles of the pelvic apparatus."

Von Graff (1933) reports 26 cases of nulliparous prolapse. Only 7 of these required operative treatment as the remainder were symptomless and discovered only accidentally. He suspected spinabifida occulta in 4 of these 7 and had them X-rayed. The findings were: 2 showed defect in 1st sacral arch; I showed an unusually wide foramen between the last lumbar and the 1st sacral vertebra; I showed a normal sacrum. He mentions I other woman without prolapse who showed an occult spina bifida.

Laws (1937) defines occult spina bifida as "a developmental deformity in which there is a cleft in the laminae of one or more vertebrae but no external sac."

He X-rayed 25 parous women on whom he had operated for prolapse and only I showed spina bifida. He also X-rayed 3 parous women who had an early recurrence after operations for procidentia and all 3 showed a spina bifida occulta. He then examined the films of 25 women X-rayed for kidney lesions; only I showed spina bifida occulta of the same severe degree. He concludes "if we discard minor posterior fusion defects of the first sacral arch and all varieties of sacral hiatus there will remain an incidence of at least 4 per cent

in adult women that must be considered definite cases of spina bifida occulta."

Sturmdorff (1919) is of the opinion that the majority, if not all, of the vaginal cases of prolapse are due to the existence of an unrecognized spina bifida occulta which involves the 4th sacral nerves with consequent paralysis of the levatores ani.

This rapid summary of some of the more important references to a relationship between spina bifida occulta and nulliparous prolapse does not provide us with a firm starting point for the following reasons:

- (1) In most papers there is no clear indication of the parity of the patients.
- (2) With the exception of Heynemann no author gives a definition of what bony defect he accepts as evidence of spina bifida occulta and as no X-ray photographs are reproduced we cannot form an opinion.
- (3) The controls offered are not, in our opinion, well chosen.

In the literature dealing with variation in development of the lumbo-sacral region in apparently healthy individuals we again find difficulty in interpretation. The authors do not always indicate the source of their material in the groups they survey, or perhaps do not differentiate between males and females or state whether any steps had been taken to exclude patients with certain symptoms.

For instance Friedman, Fischer and von Demark (1946) quote various authors who give figures for the incidence of sacral spina bifida occulta varying between 5 per cent and 35 per cent, but the level at which the defects occur is not always stated.

On account of these difficulties we have selected the work of Brailsford (1934) and Trotter (1947) for comparative purposes: Brailsford, because he bases his observations on a large number of X-ray examinations and Trotter, because hers is the most

recent study of a large anatomical collec-

In view of the possible variables in the papers mentioned above we have set ourselves to eliminate as many variables as possible from our material.

With the help of many colleagues all over the British Isles, to whom we express our warmest thanks, we have collected X-rays from 52 patients suffering from nulliparous prolapse and have not included in this number any patients who had, at the same time, an abdominal tumour, which, by giving rise to an increase in intra-abdominal pressure, might have been a contributory factor in the production of the prolapse.

As a control group we have X-rayed for healthy nulliparous women. In order to obtain some sort of a cross section of the general population we obtained our volunteers from two sources; factory workers 51, and medical students and nurses 50. All the volunteers declared themselves free of the following symptoms which might be associated with spina bifida occulta:

- (1) Motor weakness in lower limbs or some segment of them.
- (2) Paraesthesia, sometimes pains in corresponding zones, with loss of sensibility.
- (3) Defective sphincter control; e.g., nocturnal enuresis in an adult.
- (4) Abolition of tendon reflexes—loss of knee or ankle jerk.

The findings in the two groups of normal women were compared with each other. There was no statistical significance in the variations of the findings between the two groups so they have been combined to form one normal group.

The findings in the patients suffering from prolapse were then compared with this normal group. In order to facilitate comparison and to provide groups of large enough size, the number of groups was

reduced to 4; namely, non-closure of S 5; 4 and 5; 3, 4 and 5, or any other 3 segments; 2, 3, 4 and 5, and any other 4 or all 5 segments.

The actual results are shown in the accompanying table.

Non-closure of segments		Total	bined)	N	Nullipa prola; patie:	pse
			Per cent			Per cent
All closed	I			5		
S 5	26,	26,	25.7	10,	ro,	19.2
S <sub>4</sub> , <sub>5</sub>	43,	43,	42.6	19,	19,	36.5
S 3, 4, 5	22			11		
S 1 with 4, 5	3,	25,	24.7		II,	21.1
S 2, 3, 4, 5	2			5		
S 1 with 3, 4, 5	2			2		
5 1 with 2, 4, 5	I					
S I, 2, 3, 4, 5	I,	6,	5.9		7,	13.5

At first glance these figures might suggest that there is a higher proportion of defects at the caudal end of the sacrum in the normal woman and at the cephalad end in the prolapse patients, but the series of differences between these groups has been tested by the  $\chi^2$  test which gives a value of 2.83 with 3 degrees of freedom, i.e. P=0.4, P being the probability that these or greater differences are due to chance. As P here is considerably greater than 0.05 there is so high a degree of chance that the differences have no significance.

The individual groups which appear to give the greatest difference are those with non-closure of 4 or 5 segments in (a) the students and (b) the prolapse patients—2 in 50 students and 7 in 52 prolapse patients, but even here using Fisher's exact test (which can be used for very small numbers) P = 0.09 and so there is no significance in the difference, especially as we have selected the group where it is greatest.

Thus the conclusion from this investigation is that in our material there is no relation between the occurrence of spina bifida occulta and that of nulliparous prolapse, where spina bifida occulta is used to mean non-closure of the posterior arches of the sacral vertebrae.

There remains one possibility which has not been examined during this investigation. It might be that the elements of the 4th and 5th sacral nerves, which supply the pelvic floor, are involved in different degree even where the defects in the sacral vertebrae have the same or similar appearances. This hypothesis could be tested by examining the muscular and sensory reactions of the structures supplied by these segments, but it seems unlikely, since 5 in 52 prolapse patients show complete closure of the dorsal wall of the sacrum and the only individual with complete absence of the dorsal wall had no prolapse.

We will turn now to some comparisons between the incidence of abnormalities recorded by Trotter and Brailsford and those found in our series.

Trotter and Letterman (1944) examined

the sacra in 2 large American anatomical museums. There is no clinical history of the patients from whom the sacra were erived. The total material was 1,227 sacra ing 674 from females, of whom 234 were white women and 440 negroes. They state that the upper limit of the sacral hiatus is classically described as at the level of the lower third of the body of the 4th sacral vertebra. They find, however, that in 45 per cent of the female sacra it is at a higher level. Trotter, in a later paper (1947), gives the figure as 47 per cent for all sacra. We cannot express our findings in exactly the same way because, consequent upon variation in the position of the sacrum relative to the X-ray plate, distortion Further the exact upper limit of the hiatus is not as easy to locate in relation to a particular level on the body of a given vertebra by X-rays as it is when the bone

can be handled. With these reservations we

note that the apex of the hiatus is found above the level of the body of the 4th sacral vertebra in 73 patients amongst our 101 normal women or 72.7 per cent. This figure would be expected to be lower than Trotter's but it is significantly higher.

Trotter (1947) recorded an aperture in the sacrum between the superior and inferior extremities of its dorsal wall in 25 per cent. In our series this type of abnormality is only seen 6 times in 101 normal women or in 5.9 per cent. This figure is significantly lower than Trotter's.

The only known difference between Trotter's material and ours is that hers is composed of mixed whites and negroes. It may be that the incidence of defects in whites may differ from those in negroes, i.e., that the incidence of a high apex to the hiatus is lower in negroes than in whites and that of defects in the upper segments is higher. Unfortunately Trotter does not give a separate incidence for the two races.

Trotter (1947) found complete lack of the dorsal wall of the sacrum in 0.3 per cent of 674 female sacra. We found it once in 153 women of 0.65 per cent. From our figures it is calculated that the percentage of this abnormality is likely to lie between 0 and 3.6, so the two series are compatible. Thus, whatever the factors which produce the differences found between our figures and Trotter's for the two abnormalities previously discussed, they do not apply to the rare deformity of complete lack of the dorsal wall.

Brailsford (1934) states that he found spina bifida occulta of the 1st and 2nd sacral vertebrae in 11 per cent of 3,000 spines he X-rayed. This statement is not explained by actual figures and interpretation is difficult. If it is read to mean a defect of S1 and S2 at the same time then we found only this combination in only 2 of our 153 X-rays; 1.3 per cent. P=0.01 and therefore the discrepancy is real and not due to

chance. If the statement is read to mean defects of SI and S2 separately or together then in our series it is found 15 times in our 153 X-rays—this gives a percentage almost certainly between 5.6 and 15.6, so the 2 series are compatible. In each case we have excluded our I patient with complete absence of the dorsal sacral wall. If the former reading is correct Brailsford's higher incidence might be due to the inclusion of males or of patients who were suffering from symptoms referable to the spina bifida.

This examination of the present knowledge of the incidence of sacral deformities shows that our information is incomplete. It emphasizes the necessity for the fullest description of the material examined and for the elimination of as many variables as possible. Only when accurate knowledge is available of the incidence of symptomless bony abnormalities in healthy individuals will a proper assessment of their role in the cause of symptoms become possible.

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### ERYTHROCYTE SEDIMENTATION VELOCITY (B.S.R.) IN NORMAL PREGNANCY

BY

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That the velocity of erythrocyte sedimentation is increased during normal pregnancy has been known ever since Fahraeus (1921) first wrote about the subject. Knowledge is lacking, however, as to how soon in pregnancy this increase begins, the rate of such an increase during the different phases of pregnancy and as to the physiological limits of varying degrees of increase in different individuals. In standard textbooks vague statements only are made; either that the rate is increased "early in pregnancy" (Levinson and MacFate, 1943) or "from the 4th month of pregnancy onwards" (Höber, 1928).

Before we can hope to assess the value of B.S.R. determinations, either in normal or abnormal pregnancy, we should have the figures for a sufficiently large number of cases of normal pregnancy. An accurate and sensitive method should be used. Further the figures should be correlated with other blood, biochemical and clinical findings. It is also desirable that different observers should use the same method.

The present communication will be confined to a description of the method used and the presentation of figures representing 283 determinations during the pregnancy of I abnormal and 88 normal women. The figures have been treated so as to give the picture at 4-weekly intervals throughout pregnancy. An attempt at correlating these figures with the large number of biochemical and clinical factors concerned will be published later.

### METHOD.

The technique is a modification of Balachowsky's (1925) method, first published by the writer in 1935 (Obermer and Milton) and discussed in more detail in 1943 (Obermer). The method has the following advantages:

- (1) It is simple to perform, requires a minimum of blood and the simplest of apparatus.
- (2) It obviates errors due to variations in temperature.
- (3) The test can be carried out with equal facility and accuracy in the laboratory, consulting room and at the bedside.
- (4) It involves a minimum of physical disturbances of the blood.
- (5) It is more sensitive than other methods in common use and thus gives a wider range of physiological, physio-pathological and pathological variations.

### Apparatus required:

- (1) Francke's lancet or any other instrument for making a deep prick in the pulp of the finger.
- (2) Lengths of capillary tubing—10.4 cm. by 2 mm. bore.
  - (3) Plasticine.
- (4) Thick-walled test tube—at least 15 cm. long and not less than 12 mm. in diameter.
- (5) Pocket ruler, in metal or celluloid, 10 cm. long, graduated in millimetres.
  - (6) Leather fountain-pen holder with

safety pin to attach to waistcoat pocket to hold test tube. (When the test is to be carried out in a laboratory equipped with 37°C. incubator the test tube and holder or the dispensed with.)

(7) Small bottle of saturated solution of sodium oxalate.

Procedure. It is important that the capillary tubes, the test tube, oxalate solution and plasticine, should be kept at body temperature. They should therefore be kept in an incubator or carried in the waist-coat pocket.

The patient's hand should be immersed in very hot water, long enough to turn it lobster-red. While the patient is warming the hand a capillary tube is dipped in the oxalate solution, and allowed to fill by capillary attraction. It is then laid on a bench or bedside table, together with a ball of plasticine about 10 mm. in diameter. The patient is told to dry the hand and place it in the supine position on a towel.

A deep prick is then made in the pulp of the finger. Most of the oxalate is shaken out of the tube, leaving a column at the bottom end, of exactly 4 mm. (measured by ruler). The finger is gently squeezed with the left hand, so that a large drop of blood wells out of the pulp. The oxalated end of the capillary tube is dipped into the blood at an angle of about 60 degrees. The blood will then flow up, partly mixing with and partly pushing the oxalate in front of it. When the column of blood has been pushed halfway up, the capillary tube should be reversed, the column of blood run to the other end, and this end inserted into the drop of blood until the whole length of the tube is filled.

The tube is then placed vertically in the incubator, or dropped into the test tube in the waistcoat pocket. Readings of the supernatant plasma are taken at the end of 15, 30 and 60 minutes.

Normal limits. The upper limits of normality by this method are:

15 minutes, up to 0.4 cm. (4 mm.)

30 minutes, up to 1.0 cm. (10 mm.)

60 minutes, up to 2.5 cm. (25 mm.)

When red-blood-cell figures are available no correction need be made, unless the count is below 4 millions or over  $5\frac{1}{2}$  millions. Above or below these limits, the reading should be multiplied by the factor

R.B.C. in millions

5

Findings in Normal Pregnancy.

Of the 88 women observed (ages 20-35) 59 were primiparae and 29 were multiparae. Early postnatal determinations were carried out in 4 cases only. The mean figures are given below in Table I.

TABLE I.

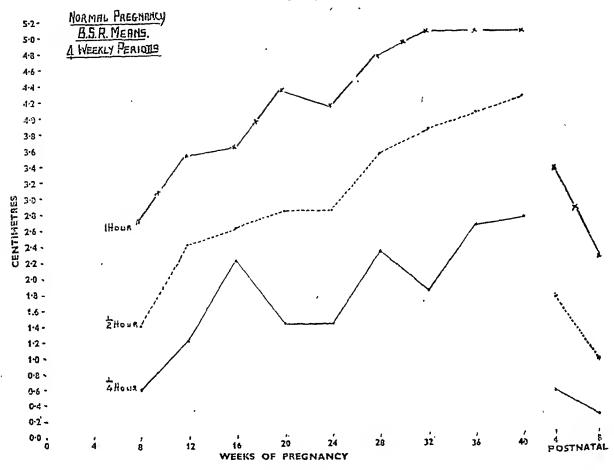
B.S.R. in Normal Pregnancy.
(4-weekly periods)
(Readings expressed in centimetres)

Weeks of	Number of	Mea	n reading	gat
pregnancy	investigations	1/4 hour	½ hour	I hour
4-8	13	0.6	1.4	2.7
9-12	26	1,2	2.4	3.5
13-16	36	2.2	2.6	3.6
17-20	31	1.4	2.8	4.3
21-24	37	1.4	2.8	4.1
25-28	37	2.3	3.5	4.7
29-32	26	1.8	3.8	5.0
33–36	39	2.6	4.0	5.0
37-40	24	2.7	4.2	ž.o
	Postn	atal		
1-4	4	0.5	1.7	3.3
4-8	4	0.2	0.9	2.2

In this series no determinations were made before the 5th week. The figures given in the table under "4-8" were calculated from determinations carried out from the 5th to the 8th weeks. The majority of such readings already showed a slightly increased sedimentation velocity from the 5th week onwards.

These figures are best presented and discussed in graphic form:





The lines representing  $\frac{1}{2}$ - and 1-hour readings show a regular, almost rectilinear, pro-After the 16th week the line representing \(\frac{1}{4}\)-hour readings is irregular. This is probably due to the increase of fibrin in the blood, at this period of pregnancy. Hence one or two tiny strands of fibrin may form during the first few minutes of the test. They attach themselves to the wall of the capillary tube and suffice to prevent sedimentation during the first 15 to 20 minutes. Before 30 minutes have elapsed these strands break and the  $\frac{1}{2}$ - and I-hour readings are unaffected. This phenomenon occurs in a relatively small proportion of cases (about 10 per cent) but may be sufficient to account for the irregularity of the  $\frac{1}{4}$ -hour line on the above graph.

### Red-blood-cell factor.

The figures given in Table I have not been corrected for the erythrocyte count. In accordance with other observers (Wintrobe and Landsberg, 1935; Walton, 1933), the writer (Obermer, 1943) does not consider it necessary to correct for the R.B.C. count when the figures are below 4 or above 5 million. The mean R.B.C. figures for this series of cases are shown in Table II.

### Physiological Variations.

There was relatively little scatter from the mean of this series, as given in Table I. There was a small percentage (less than 2 per cent) which manifested unusually slow or rapid rates. This occurs also in men and non-pregnant women, both in health and

TABLE II.

Normal Pregnancy.

Mean Erythrocyte Count.

										Post		
F.W.P.	4-8	9-12	13-16	17-20	21-24	25-28	29-32	33–36	37-40	0-4	5-8	
R.B.C.	4.6	4.5	4.5	4.2	4.4	4.3	4.1	4.3	4.1	4.4	4.8	

R.B.C.=R.B.C. expressed in millions. F.W.P.=Four-weekly periods.

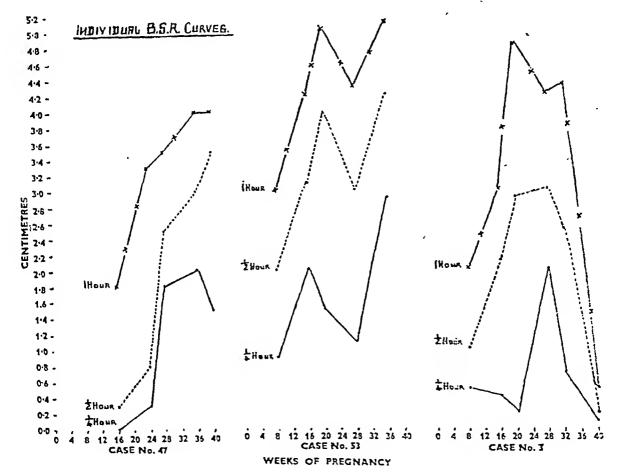
disease. These findings at both ends of a curve of frequency distribution represent an interesting problem which cannot be solved until we possess more facts as to the correlation of B.S.R. with the other factors involved—both clinical and biochemical.

The first 2 graphs below provide a quantitative illustration of the degree of variation within physiological limits—case 47 slower than the average, case 53 more rapid than the average.

Some clinical and biochemical details of these 2 cases (Nos. 47 and 53) have been published in a previous paper (Obermer, 1947a).

In case 47 the rate remained well within

GRAPH II.



the normal limits, for the non-pregnant state, up to the 25th week. The maximum rise at the end of pregnancy is also below the average. The general shape of the curves, however, was similar to that of the mean curves for the whole series—Graph I.

In case 53 the general shape of the curves is also similar. The increase of the velocity at the 8th week is, in this case, as great as the mean rise for the series at the 12th week, and reaches a maximum at the 20th week, slightly above the mean rise for the 40th week.

### A Case of Intrauterine Death.

The curves of another case (case No. 3, details published elsewhere) (Obermer, 1946, 1947b) have been included in Graph II to show the possible practical utility of routine B.S.R. determinations throughout pregnancy.

The curves of this case have a shape similar to the mean curves (Graph I) up to the 32nd week—though the last two points of these curves are plotted out as representing readings at the 32nd and 40th weeks; these last 2 readings were, in fact, taken at the 31st and 37th weeks. The readings at the 37th week (plotted on the curves as if read at the 40th week) show a steep fallpractically to the normal level for the nonpregnant state. At this time the woman was expecting admission to the lying-in block. The clinicians in charge of the case did not suspect anything abnormal. Later, labour had to be induced and the stillborn infant was considered to have died in utero-about the 34th week.

### SUMMARY.

- I. A plea is made for the use of a standardized technique by different observers.
- 2. The desirability is stressed of correlating B.S.R. figures with all other factors, both clinical and biochemical.

3. Details of a simple and accurate micro-method are given, suitable for use at the bedside and in the laboratory. Certain advantages are claimed for this method in which the figures do not need correction for variation in internal or external temperature.

Normal limits are given for readings carried out by this method.

- 4. The sedimentation velocity figures, from a series of I abnormal and 88 normal pregnancies, are presented in tabular and graph form. Two hundred and eighty-three determinations were carried out on these women, and the figures averaged out for each 4-weekly period during pregnancy.
- 5. The figures show: (a) That in the majority of normal pregnant women sedimentation velocity increases slightly as early as the 5th or 6th week. (b) That from the 8th week onwards there is a regular increase in the velocity, up to a maximum at the 40th week. (c) That after labour the velocity falls steeply; in 4 weeks to almost normal limits—for the non-pregnant state.
- 6. Curves are given representing the upper and lower physiological limits of variation: (a) from a patient whose sedimentation velocity began to increase later than normal and whose rate of increase remained less than average up to term; (b) a patient whose sedimentation velocity increased at a greater rate than the mean.
- 7. Curves are also given from a case of "intrauterine" death at about the 34th week, showing a steep fall in the velocity at the 37th week (practically to the normal level for the non-pregnant state). There were no clinical grounds for suspecting any abnormality in the pregnancy.

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### PLACENTA PRAEVIA ACCRETA

RY

W. N. CHISHOLM, M.B.E., M.B., F.R.C.S., D.(Obst.)R.C.O.G. Obstetrician and Gynaecologist, County Hospital, Whiston, Lancs.

This is an account of a case of placenta praevia accreta and the difficulties it occasioned. Briefly, the treatment adopted was a primary Caesarean section, partial removal of the placenta, plugging of the placental site and a secondary hysterectomy some days later.

Normally, if a placenta accreta is first discovered during a Caesarean section the right course of action is clear, as Mathieu (1937) said in reporting one such case:

"Fortunate indeed is the one who finds placenta accreta at Caesarean section rather than following vaginal delivery of a baby"; but if it is praevia, and partial separation occurs before or during Caesarean section, then the management is a more difficult problem.

The following are the details of the case:

Mrs. A. L., age 35. Married 8 years, one child aged 5 years.

Past History. Her first child was born at term, on 7th December, 1942; forceps delivery at home; admitted to hospital 24th March, 1943, with a history of postpartum haemorrhage starting at the sixth week of the puerperium and continuing until admission. Under anaesthesia the uterus proved normal in size and position; a curettage removed some decidual debris which was not examined microscopically.

She was re-admitted to hospital 23rd June, 1946, with a history of "menorrhagia" for 4½ years since the birth of her last child.

Physical examination revealed nothing abnormal; the uterus was anteverted, mobile and not enlarged. No treatment was advised and she was discharged from hospital on 29th June, 1946.

Present History. The last menstrual period was on 10th June, 1946, and the expected date of con-

finement, 17th March, 1947. Reviewing the case now it seems likely that these dates were wrong.

On the 16th April, 1947, her private practitioner returned from holiday, and, finding she had not yet been delivered, visited her. He found the head mobile above the pelvic brim and a vaginal examination resulted in an immediate and profuse haemorrhage. An ambulance was summoned at once, and she was admitted to hospital within a very short time of this examination. On arrival her general condition was satisfactory; slight bleeding was continuing. The urine contained no abnormal constituents; there was no oedema; blood-pressure was 110/90; the uterus appeared to be enlarged to the size of a 34-weeks' pregnancy; the vertex was high and the foetal heart sounds were heard.

On vaginal examination the cervix was high and not taken up. It admitted one finger and the placenta could be felt. There was only slight bleeding. A diagnosis of central placenta praevia was made and immediate Caesarean section decided upon.

A general anaesthetic was administered, during the induction of which she vomited undigested food.

A lower uterine segment Caesarean section was performed, the incision passing through the upper margin of the placenta. A live male child was delivered and this disclosed the placenta situated over the internal os. Up to this point bleeding had been no more than average. Search for a line of cleavage between the placenta and the uterus proved unavailing. This caused very free and alarming bleeding and in the end all that safely could be done was to remove as much as possible of the placenta piecemeal. Pituitrin 0.5 ml. had been injected into the uterine muscle which contracted well, and the operation was rapidly completed. The blood loss during the whole operation was more than average. The patient was

returned to the ward in good general condition, but, at the time, it was felt that portions of the placenta might have been left in the region of the internal os.

The postpartum loss was no more than normal. During the succeeding 6 days there was a low-grade inspiration pneumonia at the left base.

Blood count on the second day: Erythrocytes 3,000,000. Haemoglobin 55 per cent.

On the 16th day of the puerperium there was a slight red blood loss. This was repeated on the 17th day. On vaginal examination the cervix was found to be still open and gentle examination caused further bleeding. She was taken to the theatre and under sodium penthothal anaesthesia a finger was inserted into the uterus and several small portions of placenta identified in the region of the internal os. Attempts to remove these caused very free bleeding. The patient's general condition did not justify any major surgery then; a firm pack was inserted into the cervical canal; a blood transfusion was commenced and was continued for the succeeding 24 hours.

Two days later, on the 19th day of the puerperium, the patient's general condition had improved. She was accordingly taken to the theatre and the pack was removed. Immediate and alarming haemorrhage again occurred. Under gas, oxygen and ether anaesthesia the abdomen was rapidly opened and a total hysterectomy performed. Blood transfusion was recommenced. Vaginal and supra-pubic drains were inserted and the abdomen closed.

On the following day intravenous therapy was discontinued, the patient having had by then 4 pints of whole blood, 3 pints of plasma and 1 pint of glucose-saline.

The patient thereafter steadily improved, the wound healed soundly, and on discharge from hospital on the 56th day her general condition was very satisfactory.

Pathological Report. The specimen shows some several cotyledons of placenta infiltrating deeply into the wall of the lower segment, so firmly attached that their removal, even in the isolated specimen, is impossible.

Microscopical Report. There is a complete absence of the decidua basalis. Nitabuch's layer is poorly defined and the villi lie mostly on the cedematous muscle layer. Though some of the villi are healthy, many are degenerate and there is well-marked thrombosis in the maternal sinuses and in the foetal villi.

Baby. Male, weight 5 pounds 12 ounces; length, 19 inches; circumference of head, 13 inches.

From birth the baby had twitchings, cyanotic attacks, and was reluctant to feed. It rarely moved its legs; no pulsation could be felt in the femoral arteries.

A coarctation of the aorta was provisionally diagnosed. The baby died on the 8th day.

Postmortem.

Heart. (a) Patent ductus arteriosus. (b) Narrowing of the aorta between this and the subclavian artery. (c) Patent intraventricular septum. (d) Narrowing of ascending and descending colon, lumen about ½ cm., with an area of gangrene in the ileum—cause not obvious.

### DISCUSSION.

Placenta accreta has been defined as abnormal adherence, either in whole or in part, of the afterbirth to the underlying uterine wall (Kaltreider, 1945), and the characteristic pathological finding is either entire absence or deficiency of the basal decidua. Three varieties have been recognized.

- r. Placenta accreta where there is no line of cleavage between the placenta and the uterine wall.
- 2. Placenta increta, where the villi penetrate deeply into the muscle.
- 3. Placenta percreta, where the villi penetrate the peritoneal covering of the uterus.

The incidence has been estimated by various authors from I in 1,956 cases to I in 20,000.

It has been said that its cause is some previous damage to the endometrium, e.g.: Manual removal of placenta, infection of the endometrium, fibroids, previous application of radium, previous Caesarean section, previous curettage, tuberculous peritonitis, therapeutic abortions. It has

also been ascribed to abnormal endocrinal conditions.

One or other of these aetiological factors, however, is present in a great number of pregnant women, and if they have, in fact, any bearing on the occurrence of placenta accreta one would expect it to occur more frequently than it does. In the present case a curettage had been performed. It may be, of course, that many minor degrees pass unrecognized under the diagnosis of The fact that the adherent placenta. patient had a secondary postpartum haemorrhage after her first labour suggests that this may have been the case. This observation fits in well with the experience that so-called adherent placenta does tend to recur.

Placenta accreta praevia is naturally still more uncommon. In the 86 cases of placenta accreta reviewed by Irving and Hertig (1937) it was praevia in 13 instances. Of these 13 patients, 8 died. I have been able to find only 3 other cases reported during the past 10 years, Wilens (1942), Shotton and Taylor (1944) and Gemmell (1947). Each of these cases survived.

### TREATMENT.

The difficulty of a case such as the one just described is that the diagnosis cannot be made until attempts have been made to remove the placenta at the time of the section, and by this time partial separation has occurred because of the siting of the placenta on the lower segment, and, as happened in this case, the patient's condition will have deteriorated. The decision to adopt an expectant attitude, prepared to do a hysterectomy should the occasion arise, enables the patient's condition to be restored and also affords a slight chance of saving the uterus.

If a placenta accreta is situated on the upper segment there seems no doubt that the

proper treatment is either an immediate hysterectomy or to leave it alone to be absorbed. In Irving and Hertig's series all the patients died when manual removal was attempted. Those who survived had an hysterectomy performed. Greenhill (1945) quotes Shumann as reporting 4 women in whom the uterus was left; all survived and 2 had further children. Gemmell's patient was treated conservatively and she had another child.

Placenta accreta situated on the lower segment is a more difficult problem, in that usually partial separation has occurred. In cases where the fixation of the placenta is so extreme, as it was in the present case, the only safe treatment is hysterectomy as soon as the patient's condition justifies it. In minor degrees it might be possible to detach the placenta—such a course would always incur the risk of a formidable blood loss.

The presence of a foetal abnormality, coarctation of the aorta, is an interesting point. One wonders how far the foetal circulation is impeded in placenta accreta with a possible secondary effect on the foetal cardiovascular circulation.

I am indebted to Mr. P. Malpas for his advice with the case and to Professor T. N. A. Jeffcoate for examining the specimen.

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DANIEL DOUGAL

### Obituary

### DANIEL DOUGAL

M.C., M.D., F.R.C.O.G.

DANIEL DOUGAL, M.C., M.D., F.R.C.O.G., Professor of Obstetrics and Gynaecology in the University of Manchester, died in the Manchester Royal Infirmary on 4th June, 1948. He was born on 4th December, 1884, at Strathaven, Lanarkshire, and for a time attended the Glasgow High School, but when his father, James Dougal, M.D., left Scotland and took up a general practice in Blackburn, Lancashire, Daniel moved to the Manchester Grammar School, and, although he was ever a Scot, he spent the whole of his professional life in the University and the hospitals of Manchester, and it is with Manchester that his name will always be linked.

After taking the degree of M.B., Ch.B., he determined to specialize in midwifery and the diseases of women, and with characteristic thoroughness he set out to prepare himself for this work.

After acting as Demonstrator in Anatomy, for which he received a scholar-ship, he took house appointments at the Manchester Royal Infirmary and the Northern Hospital for women and children, until he moved to St. Mary's Hospital in 1909 and began an association that was to last for his lifetime. Here he spent the next four years, holding in succession all the Resident posts up to and including that of Resident Surgical Officer, and it was in this great hospital, justly celebrated for the

wealth of its clinical material and the distinction of its staff, that Dougal served his apprenticeship and learnt his craft.

In 1913 he joined the North of England Obstetrical and Gynaecological Society and he published his first paper in the British Journal of Obstetrics and Gynaecology, the subject being "A new Form of Pelvigraph," embodying original work on internal pelvimetry for which he was awarded the M.D., with a Gold Medal, and in the following year he obtained his first honorary appointments as Gynaecological Surgeon to the Manchester Northern Hospital and pathologist to St. Mary's. Dougal was now fairly launched as a junior consultant and had already begun to reorganize the Pathological Department of St. Mary's when the first World War broke out and he was called forthwith to military duty: for after serving in the Officers' Training Corps as a student he held a commission in the Territorial Army, and he was therefore mobilized at once and sent to France. Here he served with the 52nd Field Ambulance until he was appointed to the Staff in 1917, when he became D.A.D.M.S. to the 34th Division. He made an excellent Staff Officer, albeit a little unusual in that he combined personal efficiency with altruism, and he retained this appointment until the end of the war, his services being recognized by

the award of the Military Cross, the Croix de Guerre avec palm and two mentions in dispatches.

On return to civilian life in 1919, Dougal was promoted to the honorary staff of St. Mary's Hospital and to the junior teaching staff of the University. He first turned his attention to the completion of the Pathological Department of St. Mary's and was largely instrumental in obtaining the appointment of a full-time technician, for he was one of the first to insist that a laboratory is an essential part of a hospital and that pathological investigation is an indispensible feature of clinical work. He began teaching in the University and in the wards and out-patient departments and took his full share of routine work in the institutions to which he was attached. He also associated himself with many extramural activities in Manchester and elsewhere, and there were indeed few projects of importance to obstetrics and gynaecology in which he did not take an interest and exercise some degree of control.

During the next few years he steadily increased his reputation as a hard worker, organizer, teacher and clinician, and it was therefore no surprise when he was appointed to the chair of obstetrics and gynaecology on the death of Fothergill in 1927. Dougal held his university appointment on a part-time basis, although the work absorbed much of his time, and indeed money, for until recently the chair carried an honorarium of only £25 per annum; but he realized the importance of teaching and accepted this onerous appointment knowing full well what it meant if he were to fulfil the obligations laid upon him. With very little technical assistance (although what he had was of fine quality, and no account of Dougal's professoriate would be complete without an acknowledgement of the great help given to him by Dale, his technician), and provided with

limited and almost inaccessible accommodation at the top of the Medical School, Dougal organized and expanded the existing facilities for teaching and developed and enriched the museum by adding many beautifully mounted specimens, drawings and models, together with a fully documented catalogue.

For each of his formal lectures Dougal went to great pains to produce extended notes, which were available to the students and which made for them a complete textbook. These notes were fully illustrated by drawings and photographs, and they were periodically revised and brought upto-date, and it was anticipated that ultimately they would appear in book form. Dougal never found time to carry this into effect although publication is adumbrated in his penultimate paper in the Journal entitled "An improved arrangement of subject matter for a Combined Textbook of Obstetrics and Gynaecology." His last piece of work for the university, which he completed just before the onset of his last illness, was to enlarge the department still further by increasing the number of the teaching and technical staff, and by providing additional space and equipment for pure research. Dougal loved teaching, and devoted himself wholeheartedly to the interests of his students, with whom he was always popular, and it is not too much to say that largely as a result of his personal efforts his department became one of the best of the university teaching centres in this country.

He was also deeply committed to his hospitals, not only to St. Mary's but also to the Manchester Royal Infirmary, where for some years he undertook all the gynae-cological work single-handed, and his interest in these institutions was not limited to the treatment of patients and the teaching of students, but embraced every aspect of their work and every means for increas-

ing their efficiency. His organizing ability and gift for administration were invaluable in committee work, and he was an active and prominent member of many committees and boards of management. Of his purely professional qualities it is difficult to speak in moderation, but of one who deplored overstatement it must suffice to say that he was a fine clinician and the sort of operator that another surgeon would choose for himself, whilst his character, as much as his attainments, earned for him the abiding trust of his patients.

But if the university and his hospitals together with the growing demands of private practice made great calls upon him, Dougal nevertheless found time for many other pursuits, both professional and otherwise. He was a constant supporter of the North of England Obstetrical and Gynaecological Society and occupied all its offices from local secretary to president. He hardly ever missed a meeting and rarely failed to make some contribution to the proceedings. His industry in this respect may be judged from the fact that he presented to the society no less than 80 formal communications, consisting of papers, notes, records of cases and descriptions of specimens, and this number is exclusive of his contributions to the discussion of the papers of other members. His own papers were illustrated by drawings (some signed D.D.), photographs and lantern slides, and, when appropriate, by the projection of histological preparations upon the screen (the slide and lantern being manipulated by Dale), all of them showing careful preparation, attention to detail, and a strict regard for the truth. He was a lucid and easy speaker and although he never spoke for the sake of speaking, he could always be relied upon to fill a gap, and he was for long regarded as one of the main supports of the society.

He was a director of the British Journal

of Obstetrics and Gynaecology, serving as a member of the editorial committee for many years-latterly as chairman, and much of his published work appeared in its pages. These papers covered a wide range of subjects in both obstetrics and gynaecology and, although they are not founded to any extent upon original research of the so-called academic type, they record the results of much clinical and pathological investigation carried out in the wards and the laboratory and reveal an active and original mind fully conversant with the methods and results of modern research. He was distinctly in advance of his time in regard to the clinical significance of pathological investigation and in its application to teaching, and although it was quite foreign to his nature to claim priority for himself in any sphere of activity, he was certainly early in the field in this country in the study of endometriosis. His interest in this subject was shown in 1937; when he was invited to visit America to deliver the Joseph Price oration and he chose for his subject "The Problem of Endometriosis."

He was elected to the Gynaecological Visiting Society of Great Britain in 1921, and with his fellow members he visited France, Germany, Norway, Sweden, Holland and other countries in Europe, and all the teaching centres in Great Britain; indeed, during the whole period of his membership he was absent from only two of its meetings—probably a unique record, even for a society in which regular attendance is an absolute condition of membership.

He was an ardent supporter of the movement which led to the formation of the Royal College of Obstetricians and Gynae-cologists, a foundation Fellow of the college and sometime member of council and vice-president, and there can be no doubt that had he lived he would have been elected to the presidential chair. He was

also a Fellow of the Royal Society of Medicine, an Honorary Fellow of the Edinburgh Obstetrical Society and an Honorary Fellow of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons. For many years he was a member of the Manchester Medical Society and its president in 1947, when he delivered an address entitled: "From the Foetal Point of View". He was also a member and ex-president of the Manchester Pathological Society. He was present at all the British Congresses of Obstetrics and Gynaecology held between the two warstaking an active part in their proceedings —and he was chosen to represent British gynaecology at the International Congress held at Amsterdam in May 1938, when he read one of the principal papers on the "Aetiology of Thrombosis and Embolism". In addition to his professorial duties in Manchester, he acted at various times as examiner to the universities of Liverpool, Wales, Sheffield and Cambridge, to the Royal College of Obstetricians and Gynaecologists, and to the Conjoint Board; mention must also be made of his work as a teacher and examiner of midwives, and for many years he was presiding examiner in Manchester for the Central Midwives Board. For such work his wide experience and personal qualities made him an ideal choice, for his kindly manner put the most nervous individuals at their ease, and he always managed to get the best out of a candidate and, one may add, out of his fellow examiners.

Inevitably Dougal was in much demand as a consultant, and he was always ready to respond to the calls made upon him by members of the medical profession on behalf of themselves and their families, and few men can have done more in this way to earn the gratitude and esteem of their colleagues. It must not be thought, how-

ever, that the whole of Dougal's time was filled with work, far from it, for he believed that leisure was essential to good work and in spite of his professional responsibilities he found time for many other activities and for much reading. Reference has already been made to his services in the first World War: after the war was over he retained his interest in the R.A.M.C. and when the second World War broke out he again threw up his civilian work to organize and command a large military hospital at Davyhulme, Manchester, where he remained as colonel-in-charge for nearly a year, with Dale. his technician, as his sergeant-major.

As a young man he was keen on golf, but his liking for this game was challenged and soon superseded by an interest in flyfishing, which quickly developed into an ardent passion, and thereafter the pursuit of the trout occupied much of his leisure. He also took a great interest in old pewter, of which he formed a large and very choice collection, and with his usual enthusiasm he joined the Society of Pewterers, eventually becoming its president-and, incidentally, an authority on somewhat esoteric subject. became a member of the Fly Fishers' Club and other fishing societies, and fished chiefly in Scotland and Derbyshire. His love of angling took him many times to his native country, where he seemed so much at home among its lochs and mountains, and he was particularly attached to Invergarry, near Fort William, to which over a period of years he paid an annual visit, and where, in 1946, he achieved one of his ambitions by taking a record trout out of Loch Lochy. He was also very fond of the rivers of Derbyshire, and for a long time Rowsley was a favourite haunt. with the "Peacock" as his headquarters, he practised the art of the dry fly purist and took many "rainbows" out of the Wye.

This year he insisted on going there as usual in May, although he was a very sick man and unable to walk far, much less to wade, but he overcame this difficulty by providing himself with a stool and sitting on the bank, and thus undefeated to the last, captured two brace of fish!

The St. Andrew's Society of Manchester naturally claimed his membership and he was its president for a number of years. Their annual gatherings on November 30th gave full scope for Dougal's talents and on such occasions, wearing his decorations and looking his best in highland dress, he conducted the ceremonies with a fine dignity, and excelled himself as an after-dinner speaker when introducing the guest of honour in words that revealed his dry humour and gentle wit, and above all his love of Scotland.

It was, however, in his own home and in the presence of a devoted wife who was his inseparable companion, that Dougal revealed himself most fully and disclosed those qualities of heart and mind which made up his strong and lovable personality. Here he cultivated the art of living and here he entertained his friends, and a constant succession of visitors, around a table at which all were made to feel at home.

It remains to say something, however inadequate, of the man himself. Dougal had blue eyes which looked at one with a penetrating and slightly quizzical but entirely friendly expression; he was quiet in speech, unobtrusive in manner, and unhurried in movement, but his bearing was dignified, and his whole appearance gave the impression of honesty of purpose and latent force. He had a strong and

self-reliant character and was a man of complete integrity in whom everyone trusted and, although he possessed natural gifts for organization and leadership, he avoided the limelight and was singularly free from the taint of selfishness. His character is admirably expressed by his coat of arms—the crest, the head of a bull, of which he had the courage and strength, but none of the fierceness—and his motto fitted like a glove—Stand Fast—a veritable mot juste.

His capacity for work was immense and until his last illness, which began about two years ago, his physical strength was apparently inexhaustible in spite of the constant demands made upon it. It has been said by one of his younger colleagues who knew him intimately that Dougal had an "inherent capacity for control" and that he was the controller or "stabilizer" of many of the institutions and societies to which he belonged. This is undoubtedly true, but his direction of affairs and of men was never dictatorial, for his "capacity for control" was exercised first and foremost upon himself, and his influence upon others was wielded more by example than by precept. He was inflexible in carrying out what he considered to be his duty and unyielding upon a matter of principle, but his methods were never harsh, and certainly few men have been so generally liked. It is indeed remarkable that such a strong character should inspire so much affection as well as respect. Daniel Dougal leaves behind him a fine record of work and achievement and it may truly be said of him that he was one of the best "all rounders" of his age and generation.

### ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS MATERNITY MEDICAL REPORT

Report of a Committee appointed by Council in July 1946.

Adopted by Council, 22nd May, 1948.

### INTRODUCTION.

Many maternity hospitals and maternity departments throughout the British Commonwealth have issued annual medical reports since Dr. Charles J. N. Longridge, in 1905, published the first report on the practice in Queen Charlotte's Maternity Hospital. The form of such reports followed the pattern set by Dr. Longridge until 1928, when a Committee of the Obstetric Section of the Royal Society of Medicine made a standard plan which has been widely adopted. In view of the application of modern developments in medical practice the time seemed to be appropriate for a review of that standard form of report, and at the request of the Obstetric Section of the Royal Society of Medicine the College appointed a committee in July 1946 with the following terms of reference:

"To make recommendations for revising the standard form of annual maternity hospital reports, to report any changes that are immediately necessary and thereafter to report annually to Council."

The Council of the College is firmly of the opinion that the publication of a medical report is of extreme value in maintaining a high standard of practice, and would go so far as to urge all maternity hospitals and departments to publish an annual report. The standard form now recommended closely follows the form used in the past and if it can be widely adopted the value of the information obtained will be enhanced by the possibility of comparisons over a number of years.

The College has appointed a sub-committee to make an annual summary of all maternity hospital reports published.

Personnel of Committee.

The President, Sir William Gilliatt; the Honorary Treasurer, Mr. A. A. Gemmell; and the Honorary Secretary, Mr. G. F. Gibberd (later Mr. H. G. E. Arthure) ex officio. Mr. A. C. Bell, London; Mr. S. G. Clayton, London; Mr. R. M. Corbet, Preston; Mr. S. Davidson, Birmingham; Mr. J. Hewitt, Glasgow; Professor A. A. Moncrieff, London; Mr. R. Newton, Manchester; Mr. A. W. Purdie, London; Mr. L. C. Rivett, London (Chairman).

On account of the illness of the Chairman, the Committee did not meet until 17th July, 1947, when it was convened with Mr. A. C. Bell as Deputy Chairman. At that meeting Mr. A. W. Purdie was appointed Recording Secretary. On the death of Mr. Rivett, Mr. A. C. Bell was appointed Chairman. Six meetings have been held.

The Council acknowledges with gratitude the work done by the Committee, in particular by the Recording Secretary.

The Committee records with gratitude the help it has received from the Ministry of Health, the Department of Health for Scotland, the Registrar General and many Fellows and Members of the College.

### PROCEDURE.

The procedure adopted by the Committe was to review the report of the Sub-committee of the Obstetric Section of the Royal Society of Medicine, 1928.

In recommending changes or the inclusion of new matter the Committee has tried to avoid those aspects of the subject which may be of passing interest only. That the changes are not very radical is a tribute to the report of the Sub-committee of the Obstetric Section of the Royal Society of Medicine Committee (1928).

The monthly medical report book of Queen Charlotte's Maternity Hospital was used by the Committee as a basis for discussion.

When a decision of the Committee has not been unanimous the majority decision has been

accepted. In no instance has a member of the Committee disagreed to the extent of desiring the fact to be recorded.

RECOMMENDATIONS AND OBSERVATIONS.

It is recommended that the standard report (Appendix A) should be made up of two sections: (1) an obstetric section and (2) a paediatric section.

It has been frequently suggested, both inside and outside the Committee, that the tables should be kept as simple as possible. Some of the tables now recommended may appear at first sight to be needlessly detailed, but after careful consideration the Committee is of opinion that any further simplification would reduce the value of the report.

While individual hospitals are free to modify the scheme to suit local conditions and to insert such additional tables as may be found desirable, the Committee urges that the form now suggested should be adhered to as closely as possible, so that statistics from different centres may be comparable.

### THE STANDARD REPORT

Comprising: Section I, The Obstetric Report.
Section II, The Paediatric Report.

The detailed plan of the report is appended (Appendix A). The report should be prefaced by an index and by a list of abbreviations that are used throughout the entire report, i.e., in Sections I and II.

### THE OBSTETRIC REPORT

The report should begin with a statistical summary presenting the principal numerical facts of the work done during the period under review.

A critical survey should follow, dealing with trends, practices and special routines, e.g., the treatment of eclampsia or toxaemia: it should be constructively critical of the work carried out in the hospital and it might be an advantage to discuss any difference of practice between individual units or departments in the hospital. Because of its importance, this critical survey should be written by a member of the senior clinical staff: if it is written by a registrar it should be approved by the senior staff before publication.

A detailed report of all obstetric cases would then follow. The arrangement of the tables recommended is indicated in Appendix A. The headings

of the various tables recommended, including the paediatric tables, are shown in Appendix B.

The report should end with a full report of each maternal death, either in hospital or after transfer to another hospital or unit, and a description of any case of special interest, such as severe maternal injury, ruptured uterus, inversion, etc.

Comments for guidance in compiling the report.

Instead of the terms "booked" and "emergency", the Committee recommends the use of the terms "booked" and "non-booked". It suggests adopting the following standards:

Booked. Any case for whose antenatal care the hospital has assumed responsibility, whether for delivery in the hospital or on the district.

Non-booked. All other cases.

Maturity. Unless otherwise specified maturity means maturity at delivery.

Previous pregnancies should be recorded thus:

Previous p	regnancies
Before 28 weeks	After 28 weeks
!	

Degree of cardiac decompensation.

It is recommended that heart disease be classified as follows (New York Heart Association, 1939):

CLASS I. Patients with cardiac disease and no limitation of physical activity. Ordinary physical activity does not cause discomfort. Patients in this class do not have symptoms of cardiac insufficiency, nor do they experience anginal pain.

CLASS 2. Patients with cardiac disease and slight limitation of physical activity. They are comfortable at rest. If ordinary physical activity is undertaken, discomfort results in the form of undue fatigue, palpitation, dyspnoea or anginal pain.

CLASS 3. Patients with cardiac disease and marked limitation of physical activity. They are comfortable at rest. Discomfort, in the form of undue fatigue, palpitation, dyspnoea or anginal pain, is caused by less than ordinary activity.

CLASS 4. Patients with cardiac disease who are unable to carry on any physical activity without discomfort. Symptoms of cardiac insufficiency or

of the anginal syndrome are present even at rest. If any physical activity is undertaken discomfort is increased.

Pre-eclampsia, essential hypertension and chronic nephritis.

It is recommended that only one table should be used, in which would be included cases of pre-eclamptic toxaemia, of hypertension and chronic nephritis. There is no objection, however, to these three groups being shown separately if preferred.

The value of the report would be enhanced if the standard adopted in making a diagnosis is indicated.

The amount of albumen should be recorded in measured units. If impossible, the words "none", "trace", "cloud", "solid" should be used rather than +, + + + + +

The degree of oedema should be recorded be means of the words "none", "slight", "moderate", "severe".

### Pyelitis.

A table for this is not recommended.

### Antepartum haemorrhage.

Only two tables for antepartum haemorrhage are recommended: I, Accidental haemorrhage; II, Placenta praevia.

The former table should include all cases of antepartum haemorrhage other than those proven as placenta praevia.

Placenta praevia should either be felt per vaginam, or seen at Caesarean section. Types 1-4 as described by Professor F. J. Browne are recommended in describing the various types.

### Uncomplicated breech.

This term indicates a breech presentation where there is no other obstetric abnormality. Extension of the limbs *per se* is not regarded as an obstetric abnormality.

If the limbs are brought down, or if any special method is employed for delivering the head, the facts should be indicated in the appropriate table in the "method of delivery" column.

Complicated breech is a breech presentation where there is some other obstetric complication endangering the child, e.g., contracted pelvis,

placenta praevia, twins, toxaemia or prolapse of the cord.

### Multiple pregnancy.

The recorded position of the second twin should be that immediately after the birth of the first.

### Labour following previous Caesarean section.

A table is recommended in view of the wide indications for which Caesarean section is performed. This table should not include elective repeat Caesarean section.

### Contracted pelvis.

A table for "contracted pelvis" is recommended. There is no objection to additional tables for "trial of labour" and/or for "suspected disproportion in cases of normal pelvis."

### Prolapse and presentation of the cord.

Attention is drawn to the importance of the column headed "size of os when diagnosed".

### Postpartum haemorrhage.

Where ecbolics are used in treatment the drug used, the dose employed and the route of administration should be stated.

### Secondary postpartum haemorrhage.

It is recommended that the following definition be adopted:

"Secondary postpartum haemorrhage includes any appreciable haemorrhage during the puerperium after 24 hours from the completion of labour."

### External version.

A small numerical table would be sufficient. Failures should be included as well as successful versions.

### Induction of labour.

A table for surgical induction of labour only is recommended, but there is no objection to a table for induction of labour by drugs alone. The induction delivery interval should always be given.

### Caesarean section.

Indications for Caesarean section should be clearly defined, e.g., "bad obstetric history"

might be amplified by more details such as "3 previous stillbirths".

The indication for the Caesarean section, e.g., breech, placenta praevia, heart disease, should be recorded in the table relative to the obstetric abnormality requiring the operation as well as in the Caesarean section table.

### Puerperal pyrexia.

Puerperal pyrexia shall mean any febrile condition occurring in a woman within 21 days after childbirth or miscarriage in which a temperature of 100.4 F. or more has been sustained during a period of 24 hours or has recurred within the period of 21 days. (This is the existing Ministry of Health standard with wording modified.)

Further, it is recommended that for the purpose of detailed scientific records of puerperal morbidity the following rules should be observed:

- (a) The temperature is to be taken by a half-minute thermometer placed in the mouth for at least 2 minutes.
- (b) The temperature is to be taken at least twice daily (morning and evening), and the evening temperature should be taken within 3 hours before the time that the patient normally goes to sleep.

In cases where the temperature is taken as a routine more frequently than morning and evening, the morning and evening temperatures only are to be considered in assessing "Pyrexia".

- (c) The day of delivery is to be counted as the first day of the puerperium.
- (d) Patients delivered before the 28th week should be tabulated separately.
- (e) Maternal morbidity should be computed from all cases of puerperal pyrexia and all fatal cases.

### THE PAEDIATRIC SECTION.

This section should include only infants born to mothers included in the obstetric section of the report.

As in the Obstetric Section, the report should open with a statistical summary.

A critical survey should follow and it should be written by the paediatrician or senior staff. If written by the registrar it should be approved by the paediatrician or senior staff.

The detailed report of the cases would follow, arranged as in Appendix B, pages 492 to 494.

The report would end with a note of cases of special interest.

### APPENDIX A

Detailed plan recommended for a Standard Maternity Hospital Report, comprising:

The Obstetric Report (Section I).

The Paediatric Report (Section II).

- 1. Index of the entire report, i.e. Sections I and II.
- 2. List of abbreviations used throughout the entire report, i.e. Sections I and II.

### SECTION I. THE OBSTETRIC REPORT.

3. Statistical summary.

						i	In-J	patients	
						-	Booked	Non-booked	Totals
Adult patients admi	tted		•••	•••	•••				
Patients delivered in	hosp	ital							
Primiparae				•••		•••[			
Multiparae				•••	••/	•••			
Patients admitted at	fter de	elivery	(B.B.	A.)					ĺ
Primiparae		•••		•••	•••	1			
Multiparae			•••	•••	•••	•••,			
Total patients delive	ered			•••	•••	•••,			Ì
Abortions	•••	•••		• • •		•••	•		-
Patients transferred	•••	•••				•••			
Maternal deaths	•••	•••	•		•••	•••;			
Maternal death rate(	death	s per 1	,000 li	ve and	stillbi	rths)			
Infants born in hosp	oital			•••		•••			
Infants born before	admis	sion (E	B.B.A.		•••	•••			
Total infants born	•••				•••	•••			
Infants transferred					•••			•	
Stillbirths				•••		•••,			
Stillbirth rate (stillb	irths	per 1,0	oo live	and s	tillbirt	hs)			
Neonatal deaths	•••	• • • • • • • • • • • • • • • • • • • •							
Neonatal death rate	(per	1,000 1	ive bir	ths)				call 4	1
Other infant deaths				•••					
								District	Totals
Total patients deliv						ŀ		1	
Abortions		•••		•••	•••	•••			1
Patients transferred		•••	•••	•••	•••	•••			
Maternal deaths		•••	•••	•••	•••				1
	 (daa4b	···		•••	,,,				
Maternal death rate Total infants born		ıs per 1	1,000 li	ve and	ı stilib	irths			
Infants transferred	•••	•••	•••	•••	•••	•			
	•••	•	•••	•••	•••	•			
	 himbh_	•••		•••		ا ا حدد			
Stillbirth rate (still Neonatal deaths		per 1,	000 liv	e and	stillDir	tns)			
		•••	···		•••				
Neonatal death rat Other infant death	c (per	1,000	nve di	rths)	•••	••••			
- The Main death	···	•••	•••	•••		{		1	

- 4. Critical survey.
- 5. Detailed obstetric report. (The tables recommended for use in the report book are shown in Appendix B, pages 484 to 492.)

### Arrangement of tables.

- Table 1. Associated diseases and conditions not detailed elsewhere, e.g., anaemia, pyelitis, diabetes, phthisis, etc.
- Table 2. Abortions, including hydatidiform moles.
- Table 3. Hyperemesis admitted for treatment.
- Table 4. Cardiac disease.
- Table 5. Pre-eclampsia, essential hypertension and chronic nephritis.
- Table 6. Eclampsia.
- Table 7. Accidental antepartum haemorrhage.
- Table 8. Placenta praevia.
- Table 9. Hydramnios.
- Table 10. Tumours associated with pregnancy, labour or the puerperium.
- Table 11. Primary uterine inertia.
- Table 12. Persistent posterior position of the occiput and transverse arrest.
- Table 13. Uncomplicated breech deliveries.
- Table 14. Complicated breech deliveries (excluding breech by version in labour).
- Table 15. Face and brow presentations.
- Table 16. Transverse and oblique lie.
- Table 17. Multiple pregnancy.
- Table 18. Labour following previous Caesarean section.

- Table 19., Contracted pelvis.
- Table 20. Failed forceps.
- Table 21. Prolapse and presentation of cord.
- Table 22. Postpartum haemorrhage.
- Table 23. Manual removal of placenta.
- Table 24. External version before labour.
- Table 25. Surgical induction of labour.
- Table 26. Caesarean section.
- Table 27. Forceps delivery.
- Table 28. Version in labour.
- Table 29. Embryotomy and craniotomy.
- Table 30. Puerperal pyrexia (genital ininfection).
- Table 31. Puerperal pyrexia (extra-genital infection).
- 6. Details of maternal deaths.
- 7. Cases of special interest.

### SECTION II. THE PAEDIATRIC REPORT.

- 8. Statistical summary.
- 9. Critical survey.
- 10. Detailed paediatric report.

### Arrangement of tables.

- Table 32. Stillbirths.
- Table 33. Neonatal deaths.
- Table 34. Premature live-born infants.
- Table 35. Congenital malformations.
- Table 36. Birth trauma.
- Table 37. Neonatal infections.
- Table 38. Other neonatal diseases.
- 11. Cases of special interest.

### APPENDIX B

I. THE OBSTETRIC SECTION.

TABLE 1.		•	ASSOCIATED DISEASES	TED DIS	EASES A	АИВ СОИВ	CONDITIONS NOT DI	DETAILED ELSEV	ELSEWHERE.	-	
D. Led		-		Previous	Previous Pregnancies		Disease or Condition	Treatment	R	Result	Remarks
non-pooked	No.		Age B	Before 28 weeks	After 28 weeks				Ĭ.	ن	
TABLE 2.			(Expulsion	of produc	esonos jo sta	ABC ption befo	ABORTION, before completion of	ABORTION, of products of conception before completion of the 28th week of pregnancy.)	oregnancy.)		
r Fried	t i		Previous	Pregnancies	sies	•	If induced .	If snontaneous:			
non-booked	No.	Age	Before 28 weeks	 	After 18 weeks	Maturity		cause (if known) and treatment	Result	Morbidity	Remarks
											-
TABLE 3.				H	rperemes	IS ADMI	HYPEREMESIS ADMITTED FOR TRE	TREATMENT.	-		,
, p	f		––– Pr	evious P	Previous Pregnancies		J. C. L.		Ä	Result	
non-booked	No.	Age		Before 28 weeks	After 28 weeks	s	on admission	Treatment	M.	Ċ	Remarks
		1		<u> </u>							

GARDIAC DISEASE.	
4.	

TABLE 4.					CAR	CARDIAC DISEASE.	(SEASE.				
	-		Previous P	Pregnancies			Degree o	f failure	Method of	Result	
Booked or Reg. non-booked No.	No.	Age	Before 28 weeks	After 28 weeks	After Maturity Lesion 8 weeks	Lesion	(Class 1, 2, 3 or 4. N.Y. Heart Assoc., 1939)	2, 3 or 4. Assoc., 1939)	delivery	M. C.	Remarks
							On admission	At delivery			

TABLE 5.

PRE-ECLAMPSIA, ESSENTIAL HYPERTENSION AND CHRONIC NEPHRITIS. (If considered advisable these may be classified under three separate headings.)

I		S	
		Remarks	
	Welght	of child	
	Result	M. C.	
	Method .	of delivery M. C.	
	If labour	state method	
	No. of days	blood before labour pressure or discharge	_
	Highest	blood	
		Oedema	
	inuria	On Oedema blood discharge pressure	
	Albuminuria	On At On delivery Maximum discharge	
	ity	At delivery	
	Maturity	On admission	
•	regnancies	After 28 weeks	
	Previous pregnanci	Before 28 weeks	
		Age	
	Dog	No.	
	1000	non-booked No.	

TABLE 6.

ECLAMPSIA.

1		<u>v</u>	<del>-</del> -
		(ешагкs	
	Kesuit	<u>-</u> ا ن	
	<u>م</u> پر	<u>×</u>	1
	Metho	delivery M. C.	
	If in-	state nethod	
	No. of days in	Octobria blood nospital ducca or pressure before state delivery method	
<u> </u>	hest d	sure b	
	H.	S L	
_	,	Oedelli	
		Before Ante- Intra- Post- sion or dis- in first admis- partum partum Total maxl- charge 24 hrs.	
URINE	Albumin	On dis- charge	,
	Nama	admis- sion or maxi- mum	
	_	Total	
		Post- partum	
	2113	Intra- partum	
		Ante-	
		Before admis- sion	
		Jabour	
;	tion	admis- sion	
Suc	<u>_</u>	•	
Previous	pregnai	Before After 28 weeks weeks	
		986	
	2	No.	
	Book	booked No.	

TABLE 7.

ACCIDENTAL ANTEPARTUM HAEMORRHAGE.

1										;					
	Ē.	revious pregnancies		Maturity			1	Cause		1	Amount of bleeding	bleeding	Result	#	
or non- booked 28 week	S	Before After At 1st 28 weeks 28 weeks hacm'h'ge	At 1st hacm'h'ge	On admission	At delivery	on fabour admission	In III Iabour	A.P.H. if known	ment	trans- fusion	Concealed Revealed M.	Revealed	Ä,	ن	Remarks
														İ	

		Remarks	
	súlt	ú	
	Result	M.	
		Treatment	
	ırity	At delivery	
HYDRAMNIOS.	Maturity	On diagnosis	
H	gnancies	After 28 weeks	
	Previous pregnancies	Before 28 weeks	,
	Age		
	To Cl	No.	
TABLE 9.	Rooled or	non-booked	

		Remarks	
	ult	Ċ.	
IIUM.	Result	M.	
R OR PUERPER	•	Treatment	
OURS ASSOCIATED WITH PREGNANCY, LABOUR OR PUERPERIUM.		Nature of tuniour	
IATED WITH	Previous pregnancies	After 28 weeks	
MOURS ASSOC	Previous p	Before 28 weeks	
TUM		Age	
	Вод	No.	
TABLE 10.	Rooked or	non-booked	

Result M. Method Weight of of child delivery Treatment P.P.H. Morbidity PROLONGED LABOUR.
(Arbitrary definition being labour lasting 48 hours or more.) 3rd stage Duration of labour 2nd stago 1st stage Time of rupture of membranes, i.e., hours before delivery Cause of delay as diagnosed Other obstetrie abnor-malities At delivery Position of foctus At ouset of labour Before After 28 weeks 28 weeks Previous pregnancies Reg. | Age Maturity Booked or non-booked

TABLE 11.

ပံ

OF THE
OF
POSITION
POSTERIOR
PERSISTENT

MA	MATERNITY, ME			
		Remarks		
	Weight	of child		
RREST.	Result	M. C.		
E AI		M		
PERSISTENT POSTERIOR POSITION OF THE OCCIPUT AND TRANSVERSE ARREST.		Treatment		
CCIPUT AN	Troop	Type of pelvis if known		
OF THE 0	Docition	Position of occiput		
OR POSITION		Maturity		
POSTERIC	Previous pregnancies	After 28 weeks		
ERSISTENT	Previous p	Before 28 weeks		
д		Age		
		Keg. No.		
TABLE 12.		Booked or Reg.		

TABLE 13.

UNCOMPLICATED BREECH DELIVERIES. (i.e., without other obstetric abnormality. Includes cases with extended limbs.)

											_
	<u></u>	Previous pr	pregnancies		Torre	Mathodof	Result		Woight		
Age		Before 28 weeks	After 28 weeks	Maturity	flexed or extended	delivery	M.	ರ	of child	or tear	Remarks

TABLE 14. (Excluding breech by version in labour.) This table includes breech delivery where some other obstetric complication is present, c.g., contracted pelvis, placenta praevia, twins, toxaemia, prolapsed cord.

		Remarks	
	17.000	of child or tear	
	Woight	of child	
,	Result	ن	
,	Re:		
		Treatment	
J. J. J. J. J. J. J. J. J. J. J. J. J. J	Obstetric	complication	
I		nancics After  Maturity	
1.0.	prcgnancics	After 28 weeks	
J	Prcvious	Before 28 weeks	
	Age		
	Per	No.	
	Rooleed or	non-booked No. Age	

TABLE 15.

FACE AND BROW PRESENTATIONS.

		· · ·	
	Kemarks (e.g., anencephaly)		
	of child		
Result	M. C. of child		
	delivery		
	Jaturity Position Treatment		
	Position		
	Maturity		
Previous pregnancies	After 28 weeks		
Previous p	Before 28 weeks		
•	Age		
Red	No.		
Booked or	non-booked No.		

TANK A CAN			
•	•	•	

AND O	labour
TRANSVERSE A	(In

Ī		narks	
	1	Remarks	
	Weight	of cluld	
1	Result	ن	
	Res	M.	
		Treatment	
igue lie.	Size of	os when diagnosed	
TRANSVERSE AND OBLIGUE LIE. (In labour).	Obstetric		
TRANSVE	Maturity		
	Previous pregnancies	After 28 weeks	
	Previous p	Age Before 28 weeks	
		No.	
TABLE 16.	-	non-booked No.	

TABLE 17.

## MULTIPLE PREGNANCY.

	Remarks		
Result	M 1st 2nd		
Type if	known		
Weight	1st 2nd		
Sex	1st 2nd 1st 2nd 1st 2nd 1st 2nd		
Presentation Method of	2nd	,	
Meti	1st		
entation	2nd		
Prese	1st		
1	Maturity		
regnancies	After 28 weeks		
Previous I	Before 28 weeks		
	Age		
Rea	No.		
Booked or	non-booked No.		

TABLE 18.

LABOUR FOLLOWING PREVIOUS CAESAREAN SECTION.

		ī
	Remarks	
ult	ن	
Result	M.	
Weight	of baby	
Mathod of	delivery of baby	
Section	Type of C.S.	
Previous Caesarian Section	. Weight of baby	
Previou	Maturity Indication Weight of baby	- 64 65
	Maturity	
pregnancies	After 28 weeks	
Previous p	Before 28 weeks	
Age		
Reg. No		
Booked or non-booked		

TABLE 19.

CONTRACTED PELVIS.

	Result	M. C. Morbidity Remarks	<u> </u>
	1	of child	
	Length of labour	2nd stage	
	Length	1st stage	`
		Method of delivery	
	Management	Trial of labour	
	лГа	Chulcal Radio-Surgical Trial of of logical Induction labour delivery	
	ric ments	Radio- logical	•
	Pelvic measurements	Clinical	
	Type of	Type ofy pelvis C	
	,	Maturit	
	regnancies	Before After 28 weeks	
	Previous pregnancies	Before 28 weeks	
		Age	
	Reg.	No.	
	Booked	Booked Reg. Age booked	

		Remarks		
	ult	ن		
	Result	M.		
`	TVoich+	of child		
	Treatment	method of of child delivery		
		failure		
FAILED FORCEPS.	Failed forceps			
	Failed	Before After admission		
		Maturity		
	us pregnancies	After 28 weeks		
	Previous p	Before 28 weeks		
		Age		
		Reg. No.		
TABLE 20.		Booked or non-booked		

PROLAPSE AND PRESENTATION OF CORD.

TABLE 21.

Result		
Re	M.	
	Treatment	
 Cance of prolance	or presentation of cord	
Size		
 vious pregnancies	After 28 weeks	
Previous 1		
Ď.		
Doctord or	,	

TABLE 22. (Primary P.P.H. by convention over 20 oz. and within 24 hours of delivery. Secondary P.P.H. includes any appreciable haemorrhage occurring subsequently during the puerperium.)

		Blood transfusion		
	Trantment	State drug, dose and route		
		Secondary predisposing P.P.H.		
	rhage			
)	Amount of haemorrhage	After delivery of placenta		
	Атош	Before delivery of placenta		
,		Duration of labour		
•		Maturity delivery of labour		
	regnancies	H 2		
	Previous pregnance	Before 28 weeks		
		Ī		
		Booked or Reg. non-booked No. Age Before Afte		

MANUAL REMOVAL OF PLACENTA,

TABLE 23.

	Remarks		
	Morbidity to mother		
Amount	Indica- of tion bleeding ozs.		
	Indica- tion		
	3rd stage		
Length of Labour	2nd stage		
Lengt	1st 2nd 3rd stage stage		
	of lst 2nd delivery stage stage		
	Maturity	٠	
regnancies	After 28 weeks		
Previous pregnancies	Before 28 weeks		
	Booked or Reg. Age Before After 28 weeks 28 weeks		
) <u>2</u>			
Booked or non-booked			

I BEFORE LABOUR.	if desired.)
回	_
BEFOR	may be summarized
80	ร
S	Ë,
VERSION	may
NAL	(This table
EXTERNAL	(This
بدر	

TABLE 24.

		1
Remarks		
sult	ပ	
Re	ĭ.	
Presenta- Result	delivery	
	if employed	
Position of legs	by X-ray. Yes. No.	
Indication, flexed breech,	breech, transverse lie	
Maturity	At At version delivery	
Mat	At version	
regnancies	After 28 weeks	
Previous pregn  Before A  28 weeks 28		
Age		
Reg. No.		
Booked or Rcg. non-booked No.		

TABLE 25.

SURGICAL INDUCTION OF LABOUR.

	Remarks				
	Result	_	M. C.		<u> </u>
	Re				
	112:21	Veignt  -			
	Duration	noon	2nd	stage stage	
	Dur	10	lst	stage	
	Mother.	of	delivery 1st 2nd		
בביומוסיום זוים סמווסיו סל חטים סיוי	After Maturity tion of interval delivery of stage stage				
NOT TOO O	Method of induction				
777	Indica- tion				
	Maturity				
	pregnancics	After	28 weeks		
	Previous p	Before	28 weeks		
	Age			ĺ	
	Reg.	Š			
	Booked or	non-booked No.			

TABLE 26.

CAESAREAN SECTION.

		marks	
	Morbidity Remarks		
		Morbid	
	Result	M	
		ĺ	
		of child	
	Duration of labour	2nd stage	
	Dur. of la	1st stage	
	1f stenlized		
CTION.	Type of operation		
Varbangan Section.	Angestratic		
COTO	Previous Previous Anaesthetic Type of 1 If Object O		
1	Previous C.S.		
		Maturity	
	Previous pregnancies	After 28 weeks	
	Previous p	Hefore After	
		Age	
	Reg.	No.	
	Booked or Reg. non-booked No.		

TABLE 27.

Remarks			
Result	M. C.		
Weight	<u>!</u>		
Duration of labour	2nd stage		•
Durat lab	1st stage		
Indication -			
Maturity			
regnancies	After 28 weeks		
Previous pregnancies  Before After 28 weeks 28 week			
Age			
Reg. No.			
Booked or non-booked			

FORCEPS DELIVERIES.

		of child M. C. Remarks		
	Bipolar	or internal		
VERSION IN LABOUR.		Indication		
VERSION		Maturity		
	regnancies	After 28 weeks		
	Previous p	Before After 28 weeks		
		Age		
	F	No.		
TABLE 28.	f	Booked or non-booked		

ABLE 29.				EN	EMBRYOTOMY AND CRANIOTOMY.	MY ANI	CRANI	OTOMY.					
Booked or	Dog		Previous p	vious pregnancies		Indica	Two	Duration of labour	of labour	Tvne of	Weight	Result	
non-booked	d No.	Age	Before 28 weeks	After Maturity tion pelvis 1st stage	Maturity	tion	pelvis	1st stage	2nd stage	operation of child to mother	of child	to mother	Remarks

TABLE 30.				PUERPERAL PYREXIA, GENITAL INFECTION.	, GENITAL INF	ECTION.			
Booked or non-booked	Reg. No.	Age	Maturity	Method of delivery. Operation, induction, manual removal, etc.	Cause of temperature	Organisms, if known	Treatment	Result	Remarks
		_					_		

	Remarks	
	Result	
	Treatment	
INFECTION.	Organisms, if known	
EXTRA-GENITAL	Cause of temperature	
PUERPERAL PYREXIA, EXTRA-GENITAL INFECTION.	Method of delivery. Operation, induction, manual removal, etc.	,
PUE	Maturity	
	Age	-
	Reg. No.	
TABLE 31.	Booked or non-booked	

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# 7. SPECIAL CASES, Details of special and particularly interesting cases should be given separately.

## II. PAEDIATRIC SECTION.

A stillborn child is defined as one born at or after the completion of the 28th week of pregnancy and which fails to breathe after birth. STILLBIRTHS.

ndings Remarks, including the done ") cause of death	
P.M. findings (if no P.M. state " not done")	
Foetal factors	
Maternal	
Method of delivery	
Sex	
Maturity of foetus	
Weight	
Reg. No.	
Booked or non-booked	

TABLE 33.

to another hospital but excluding those discharged healthy NEONATAL DEATHS. Deaths within 28 days either in the hospital or after transfer

Remarks, including cause of death	
Method of feeding	
Age at death	
P.M. findings (if no P.M. state "not done")	
Complications in infant	-
Maternal factors	
Method of delivery	
Sex	
Maturity of foetus	
Birth weight	
Reg. No.	
Booked or non-booked	
	Reg. Birth Maturity Sex delivery factors in infant (if no P.M. findings death feeding state "not done")

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TABLE
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	Remarks	
	Result	
	Day of discharge or death	
	Method of Weight on feeding	
NTS. r.)	Method of feeding	
SORN INFA	Birth injury, if any	
PREMATURE LIVE-BORN INFANTS. (Birth weight 6½ lbs. and under.)	Cause of premature labour	
PREM (Bi	Sex	
	Birth weight	
	Maturity	
	Reg. No.	
ABLE 34.	Booked or non-booked	

TABLE 35.

5	'n
	5
2 4 4 7	V
1	MALFORMATIONS.
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	Α, Α
1	Y
1	Š
	_

	Remarks	
	Intercurrent maternal diseases	
i -	Result	
	Sex	
	Birth weight	
and the contract of the contra	Nature of Malformation	
	Reg. No.	
-	Booked or non-booked	
-		

TABLE 36.

BIRTH TRAUMA.

Remarks

	Remarks	
	Result	
	Treatment	
	Predominant causal organism	
FECTIONS.	Source of Pinfection	
NEONATAL INFECTIONS.	Type of infection	
N	Sex	
	Birth weight	
	Maturity	
	Reg. No.	
TABLE 37.	Booked or non-booked	

TARLE 20

Sex disease complication delivery Treatment Result Remarks

### 11. SPECIAL CASES

Details of special and particularly interesting cases should be given separately.

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3.	

### ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At the meeting of the Council held on Saturday, 22nd May, 1948, with the President, Mr. W. Gilliatt, in the Chair, it was announced that Dr. Emil Novak, Baltimore, U.S.A., has accepted an invitation to become an Honorary Fellow of the College.

Dr. Emil Novak was appointed lecturer for 1948 under a lectureship founded to cement more closely the bonds of friendship between the British Empire and the United States of America.

Professor N. W. Philpott, Montreal, was appointed William Blair Bell Memorial Lecturer for 1948.

The following were elected to Council to fill vacancies caused by retirement, statutory and otherwise:

As representatives of the Fellows:

O'Donel Thornley D. Browne, Dublin. Malcolm Donaldson, London. H. L. Hardy Greer, Belfast. Hilda Nora Lloyd, Birmingham. H. J. Drew Smythe, Bristol. Douglas Miller, Edinburgh. Harold Jordan Malkin, Nottingham.

### As representatives of the Members:

Donald Blake Fraser, London.

Robert James Wotherspoon, Glasgow.

### The following were admitted to the Fellowship of the College:

Jermyn Oscar Baker. Sudhir Chandra Bose. Francis Joseph Burke. Harold Henry Caple. William Clement. Geoffrey Jasper St. Clair Fisher. Israel Goldberg. Charles John Kenneth Hamilton. John Stewart Henry. Ockert Stephanus Heyns. John Howkins. John Godfrey Hastings Ince. Hilda Mary Lazarus. Douglas Marshall Lindsay. Ralph Lodge. Donald Mackintosh Low.

John Robertson McArthur.
Kenneth Fitzgerald Mackenzie.
Presley Archer McLeod.
Robert Baikie Meiklejohn.
Jocelyn Adelaide Medway Moore.
Arthur Beynon Nash.
Ivan Young Patrick.
Susanne Jean Paterson.
Hemendra Narayan Ray.
Helen Elizabeth Rodway.
Walter Netley Searle.
George Albert Simpson.
John Ross Vant.
George Milburn White.
William Ralph Winterton.

### The following were admitted to the Membership of the College:

Sylvester Campbell Anderson. Ellsworth Cullen Bryant. Margaret Ellen Mary Boulton. John Montgomery Bowen. John Campbell McClure Browne. James Taylor Burrowes. Richard Waywell Burslem. Alan Waugh Chester. John Crawford. Leslie Albert Cruttenden. Peter Cronshaw Denham. John Cathcart Hamilton Dunlop. Sidney Evans. John Brown Fleming. John Frederick Foulkes. Dennis Charles Galloway. Stanley Frederick Hans. Betty Hargreaves.
Jason Robert Hassard. Rosa Hertz. John Bain Hurll. Philip Seukaran Jaikaran. Eileen Iris Jamieson. Edward Wynne Jones. Michael Maurice Kriseman.

Sylvia Lerer. Una Gertrude Lister. Florence Pamela Logan. James Theodore Louw. Samuel Douglas Loxton. Aaron Michel Michael. Narotamdas Vithaldan Mody. Cecilia Mitchell Murray. George Stuart Musgrove. Maurice James Dewar Noble. Khorshed Pasricha. Ramanlal Girdharlal Patel. Andrew Ebert Perera. Peng Teik Por. Robert Williamson Kinross Purser. Theodore Francis Redman. Otto Arnold Schmidt. Francis Shaw. Benjamin Henry Sheares. Donald Moffat Sheppard. William Robert Sloan. Bahman Sohrabji Surti. David Alexander Thomson. John Granville Thurston. May Davies Westerman.

### BRITISH MEDICAL ASSOCIATION

# THE KATHERINE BISHOP HARMAN PRIZE

for the encouragement of Research into the Disorders Incident to Maternity

The Council of the British Medical Association is prepared to consider an award of the KATHERINE BISHOP HARMAN PRIZE in the year 1949. The value of the Prize is £75.

The purpose of the Prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing. It will be awarded for the best Essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the Prize.

Any medical practitioner registered in the British Empire is eligible to compete.

Should the Council of the Association decide that no Essay submitted is of sufficient merit, the Prize will not be awarded in 1949, but will be offered again in the year next following this decision, and in this event the money value of the Prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each Essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address.

Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than 31st December, 1948.

Inquiries relative to the Prize should be addressed to the Secretary.

CHARLES HILL, Secretary.

British Medical Association House,

Tavistock Square, London, W.C.1.

April 1948.

### **BOOK REVIEW**

"Gynaecological and Obstetrical Anatomy." By C. F. V. SMOUT, M.D., M.R.C.S.; with chapters on the Histology of the Female Reproductive Tract and its Endocrine Control, by F. JACOBY, M.D. (Pp. 241, price 40s.) London: Edward Arnold and Co.

This book has changed its name. The first edition was published under the title of "The Anatomy of the Female Pelvis", and the authors state "it was always felt that this title was not altogether a happy one since it did not entirely cover the subject-matter dealt with. . . . The new title was chosen, not only because of the stress which is laid on the gynaecological and obstetrical implications of the female pelvis, but also to cover such subject-matter as the placenta and the anatomy of the foetus in its relation to childbirth."

In this new edition much has been re-written and many new illustrations added. There is no doubt that those studying for higher degrees will find this book most useful. Whether the undergraduate will use it apart from reference is problematical. The publishers are to be congratulated on the excellence of their production.

When handling a book in this class one naturally looks for information on up-to-date topics. It is suggested in two different parts of the book that there is a relation between "congenital" prolapse and spina bifida occulta. Gemmell has stated in a recent publication that he was unable to find any evidence to support this belief. Omissions noted in an otherwise comprehensive bibliography are references to the work of Moir, Allen and Morris on pelvic radiology, and Mitchell's description of the innervation of the ovary and uterine tube.

The reviewer is of the opinion that, as at present constituted, the book, while containing much excellent matter, fails to achieve the full purpose set forth in the preface. The anatomy of the ureter has been given greater consideration than in the previous edition, but the most important fact of all from the surgeon's point of view has been dismissed summarily, namely, the blood-supply of the ureter. Meigs has indicated that a factor in the prevention of ureteral fistula at radical hysterectomy is the preservation of the small vessel of supply to the ureter from the internal iliac artery just below the brim of the pelvis. The anatomy of the female urethra in relation to the "sling" operations which have recently become popular is not discussed. If the change of title of the book is to be justified such points are important. Only close association of anatomist with gynaecologist in the writing of the book will obviate these shortcomings.

### REPORTS OF SOCIETIES

#### ROYAL SOCIETY OF MEDICINE

SECTION OF OBSTETRICS AND GYNAECOLOGY.

President—A. J. McNair, F.R.C.S., F.R.C.O.G.

March 19th, 1948.

The meeting was opened by Mr. A. A. Gemmell, reading a paper entitled "Spina Bifida occulta and nulliparous prolapse."\*

DISCUSSION ON THE ROLE OF VAGINAL HYSTERECTOMY IN TREATMENT OF PROLAPSE.

Mr. A. C. Palmer: As an opener of this discussion on the place of vaginal hysterectomy in the surgical treatment of prolapse, I would ask you to regard my remarks as an expression of personal opinion. It is true that this opinion is based on experience.

Round about 1920, the idea took shape that some forms of prolapse required removal of the uterus in the attempt to rebuild the pelvic diaphragm. During the last 25 years this idea has ripened into conviction.

It is interesting that the surgical treatment of prolapse is not yet standardized, and that it lies somewhere near the frontier of gynaecological surgery. It does this, in spite of the fact that prolapse must be as old as civilization and very nearly contemporary with the first labour. It remains true that men of great experience are not yet agreed on the best methods of obtaining a stable result.

My answer to the question "What is the position of hysterectomy in the surgical treatment of prolapse?" can be summarized in 3 words: (1) Never; (2) Sometimes; and (3) Always. With regard to Never, this applies to the condition when prolapse is confined to the walls of the vagina; Sometimes, when the cervix is in the first stage of procidentia,

that is to say, when it has fallen to round about the vulval level; *Always*, when the cervix is outside the vulva.

The variations in treatment depend upon what has happened to the utero-sacral ligament. If the cervix has reached the vulva by stretching and without damage to the utero-sacral ligament, hysterectomy is contra-indicated. If, on the other hand, the cervix has brought the utero-sacral ligament down to the vulva with it, so that the index finger can easily be hooked round the ligament, then I think hysterectomy is indicated. When the cervix is well outside the vulva, it must bring the utero-sacral ligament down with it, and in my opinion, is always an indication for hysterectomy. Removal of the uterus means that the utero-sacral ligaments are in fact shortened and when approximated in the midline, stabilize the vault of the vagina. In my hands, infolding the ligaments below and in front of the cervical stump, does not stabilize the vault of the vagina and too many of my cases have come back in a year or two, with the vagina again everted. After hysterectomy, only 3 out of 300 cases have returned with an enterocele and I with a cystocele. These were due to errors in judgment during the operation.

If my remarks appear dogmatic, I would ask you again to regard them as a personal opinion.

Mr. John Howkins: I am fully conscious of the value and efficiency of Fothergill's operation, and I am not proposing that Mayo's operation should replace this well-tested old friend, which has held the field in the hands of so many different surgeons, employing many different techniques. I would submit, however, that the keystone doctrine is open to a fallacy. The vault of the vagina and the cardinal ligaments are not rigid structures, and do not give strength in compression as an arch does.

In removing the uterus, at or near the menopause, one frequently eradicates an organ which may be causing symptoms of excessive bleeding,

<sup>\*</sup> To be reproduced in full in a future issue of the Journal.

which may harbour fibroids, or even a carcinoma. The chief advantage of the operation is that when the uterus has been removed a very efficient fascial shelf can be reconstructed from the total depth of the broad ligament down to and including the utero-sacral ligament, and the chief recommendation of this shelf is that by sewing the round ligaments together, and anchoring them to the triangular ligament they form under the bladder neck a kind of Millin's sling, made of round ligament. The effect that this has upon stress incontinence is, I submit, most beneficial.

Once a surgeon is used to the operation he will find it easier to perform than Fothergill's operation. The great criticism of vaginal hysterectomy in the past has been its liability to produce a subsequent hernia of Douglas's pouch, and in this small series, in which every case has been personally examined by me, I have found one such hernia, and I operated on it at once, so that I should have a clean bill to present to this meeting. I have now altered the technique of the operation, as you will see in the film, and by very special attention to the suturing of the utero-sacral ligaments across Douglas's pouch, and I think that with improved technique and greater experience, hernia here will become uncommon.

Prolapse is a most distressing and disabling condition, limiting the social activities of the citizen. The day of pill and pessary gynaecology is passed, and I am happy to say that I have inserted no rings or Napier's pessaries, or any other contrivance in the last two years. There is no more grateful, and no more rejuvenated person than the successfully operated upon prolapse case, and there is no more pathetic spectacle than the woman who has worn a ring for 20 or 30 years, with stress incontinence, which a ring never cures, and pessary inceration and vaginitis, not to mention the possibility of a cancer developing from the ring. Let us therefore not deny the benefit of surgery to any of these cases.

MR. V. B. GREEN-ARMYTAGE: I am of the opinion that enterocele either before or after vaginal hysterectomy is more rare than the openers have declared, but if it does exist then in order to cure it I feel that non-absorbent sutures should be used to bring together the intero-sacral ligaments. This is a matter of some importance. Stress incontinence was remarkably absent in the majority of

patients after the operation that I did, for the most important step from the patient's point of view was to bring the top of the bridge made by the application of the broad ligaments up against the inferior surface of the peritoneum under the bladder, and this was done by a stitch which was attached to the subpubic angle on either side of the urethra. It is a good thing to hear that the younger members of the Society were thinking well of this operation, but of course we should all remember that the criterion of any operation is its trustworthiness, and that one must bear in mind that vaginal hysterectomy is more difficult than a Fothergill and that the neophyte must be capable of being able to deal with such complications as occur in 2 per cent of all cases. Having done more than 1,000 Ward-Mayo operations, and over 2,000 vaginal hysterectomies, I feel sure that for prolapse, vaginal hysterectomy is, in 75 per cent of patients, a better operation in women over the age of 40 than the Fothergill. The patient should be kept flat for 5 days at least, and a selfretaining catheter kept in for 2 days or more. No dressings should be applied but simple spraying with acriflavine and spirit.

The following speakers also contributed to the discussion: Mr. Wilfred Shaw, Mr. Arthur Gemmell, Mr. Leslie Williams, Professor Macafee, Mr. William Hawksworth, Mr. A. J. Wrigley, Mr. Everard Williams and Mr. C. M. Gwillim.

# NORTH OF ENGLAND OBSTETRICAL AND GYNAECOLOGICAL SOCIETY.

A meeting of the Society was held in Manchester on 5th March, 1948, with the President (Mr. J. E. Stacey) in the Chair.

Dr. R. M. Corbet (Preston) described a case of Pregnancy Complicated by Large Hydronephrosis.

The patient, aged 36, had had one previous pregnancy which had ended in abortion at the 3rd month and when first seen on 11th October, 1946, was approximately 18 weeks pregnant. There was no history of previous ill health and she did not have any special complaints except swelling of the abdomen, which she attributed to the pregnancy. On examination she was found to have a large

cystic swelling filling the upper abdomen, lying above the uterus and rather to the left of the middle line. The urine was normal and the blood-pressure 110/70. The outline of the tumour, separate from that of the uterus, was demonstrated by radiographs and a provisional diagnosis of ovarian cyst was made. On 30th October, 1946, laparotomy was carried out by left paramedian incision and the cyst was found to be extra-peritoneal, extending from the pelvic brim to the diaphragm on the left The descending colon was lateral to the tumour and the transverse colon crossed it. Mr. Arnott then took over the operation, mobilized the colon, partially collapsed the cyst and then shelled it out with difficulty. The only pedicle-like structure was found at the upper pole where at least one large vein was ligated. After removal of the cyst the left kidney could not be found, the right kidney felt enlarged. There was very little bleeding, the area was re-peritonized and the abdomen closed without drainage. The patient made a good recovery without complications.

The cyst was about 9 inches in diameter and contained approximately 8 pints of fluid which unfortunately was not analyzed. Definite kidney tissue was not found in its wall, which was lined in patches by cuboidal or flattened cells with a suggestion of stratification here and there. On one side was an almost obliterated tube which might have been a ureter. The histological findings were in keeping with a diagnosis of hydronephrosis but were not conclusive. The position of the cyst and the absence of the left kidney as revealed at operation and by subsequent intravenous pyelography, however, made the diagnosis reasonably certain. Pyelography also showed the presence of a right-sided hydronephrosis.

The pregnancy continued normally and the patient remained well until the 37th week when her blood-pressure rose to 140/90. The blood urea varied from 18 to 27 mgm. per cent. In view of the rise in the blood-pressure and the possibility that renal function might deteriorate, labour was induced by artificial rupture of the membranes at the 38th week. The position of the foetus was left occipito anterior with the head still free. Labour ensued 48 hours after puncture of the membranes and lasted 14½ hours before being terminated by a low forceps delivery for delay in the second stage. Extraction was a little difficult and

the baby developed cephalhaematoma which became infected, but ultimately did well.

Intravenous pyelography carried out repeatedly after delivery showed rapid diminution in size of the right hydro-ureter, until at 6 months the appearances were regarded as normal for a patient who had only one kidney.

The history of the case suggested that the left hydronephrosis developed, or at least increased considerably in size, during the pregnancy, otherwise the patient could hardly have failed to notice the tumour. Dr. Corbet concluded by making reference to the prognosis in this case should the patient conceive again in the future.

The President said that cases of this kind usually presented difficulty in diagnosis and errors were the rule rather than the exception. He asked why labour had been induced prematurely and expressed the view that this operation is carried out too frequently and for inadequate reasons. He, together with many members of the Society, referred to similar cases and also to cases in which one kidney had been removed during or before pregnancy and in which pregnancy appeared to cause the patient no harm. The general opinion was that nephrectomy was not an indication for terminating pregnancy providing renal function tests were satisfactory. Professor Claye (Leeds) commented on the position of the pedicle and Mr. Scott Russell (Manchester) pointed out that the diagnosis could have been made before operation had more attention been paid to the relationship of the transverse colon to the tumour as shown on the radiographs which Dr. Corbet demonstrated. Mr. Calvert (Stockport) mentioned a case in which a hydronephrotic kidney had been removed during pregnancy, the pregnancy not having been diagnosed. Professor Jeffcoate (Liverpool) referred to a case previously reported to the Society in which hydronephrosis developed in a pelvic kidney during pregnancy and obstructed labour on 2 occasions. The tumour, the nature of which was still not recognized, was removed at the time of the second Caesarean section and neither pedicle nor ureter were seen nor were any vessels ligatured. The patient subsequently had a normal pregnancy and confinement.

Dr. Corbet replied and agreed that in retrospect the position of the transverse colon was clearly of diagnostic significance. Mr. John Hamilton (Liverpool) described a case of:

#### LARGE FIBROID UTERUS

A nulliparous woman of 55, married for 71/2 years, had had very heavy periods for 7 years and these had been irregular for 4 years. She had been told 14 years earlier that she had uterine fibroids. On examination she had an abdominal tumour considerably larger than that of a full-time pregnancy, and suffered from very severe anaemia (red-blood corpuscles 1,500,000; Hb. 15 per cent). Repeated slow blood transfusions appeared to bring on further uterine haemorrhage and operation was performed when she had had 8 pints of blood and the haemoglobin level was raised to 45 per cent. Total hysterectomy with removal of both appendages was carried out, the only difficulty being the weight and size of the tumour. Four pints of blood were transfused post-operatively and the patient made a good recovery. Two months after operation she was extremely well. The uterus was enlarged by a single fibroid weighing 32 pounds and showing extreme hyaline degeneration and cystic change. The cavity of the uterus measured 13 inches.

The President said that this tumour, although large for modern times, did not compare with those treated in the past. He himself had removed an ovarian fibroma weighing 58 pounds and he recalled watching Mr. T. G. Stevens remove a uterine fibroid which weighed 78 pounds and which had to be manipulated by block and tackle and meat hooks specially assembled above the operating table.

Mr. John Hamilton (Liverpool) described a case of:

#### RUPTURED HORN OF A BICORNUTE UTERUS

He pointed out that this complication is comparatively rare and usually presents all the features of ruptured ectopic pregnancy with extremely severe shock. The patient, a woman of 24, had had regular but painful menstruation from the age of 12 until 28th February, 1947, after which she conceived. She had slight spotting of blood on several occasions after that date, and her doctor had examined her and had questioned the possibility of her pregnancy being complicated by a fibroid. On 11th July, 1947 (after 18 weeks' amenorrhoea), she was seized with severe pain in the left side of the abdomen and this was followed by vaginal bleeding. A state of

extreme shock developed and the abdomen was distended, rigid and tender. Laparotomy was carried out as soon as could be arranged, blood transfusion being commenced simultaneously. The foetus within its sac was lying free in the peritoneal cavity which also contained a large quantity of free blood. One horn of a bicornute uterus was ruptured across its fundus. This horn was removed, the other horn, which was well developed, and both Fallopian tubes and ovaries being conserved. The patient made a rapid recovery which was complicated only by a low-grade but persistent urinary infection. A uterine cast was passed in 2 pieces during the first week after operation.

Afterwards the patient had no further dysmenorrhoea and hysterosalpingography confirmed that the remaining horn was well developed and of good shape. Mr. Hamilton concluded by asking for opinions on the outcome and management of any subsequent pregnancy and delivery. He showed the specimen of foetus, uterine horn and decidual cast.

The President said that considering that bicornute uteri are common it is surprising that rupture of one horn is not seen more often. Mr. Malkin (Nottingham) described a similar case in which he had been able to implant the Fallopian tube from the affected side into the remaining uterine horn. Mr. Newton (Manchester) said that although this complication was not very common he at one time saw 3 cases within 3 months, and in one of these a diagnosis of retroverted gravid uterus had been made before the rupture occurred. All 3 patients had previously suffered from unilateral dysmenorrhoea. Mr. Corbet (Preston) said he did not think that Caesarean section should be necessary should the patient conceive again. Mr. Hamilton replied, and said that in his case the dysmenorrhoea had been unilateral and that a communication between the cavity of the ruptured horn and the cervical canal were seen at operation.

Miss K. Liebert (Manchester) described:

# A Case of General Peritonitis Following Abortion, Treated with Streptomycin.

The patient, aged 23, was admitted on 29th November, 1947, as a case of threatened abortion. She had one child 4 months old and her last menstrual period had commenced on 17th October, 1947. In 1946 she had been treated for peritonitis

and salpingitis, and laparotomy and drainage had been carried out at that time

On admission the cervix was found dilated with products of conception protruding through it. Abortion took place spontaneously after 4 injections of oxytocin at 1/2-hour intervals. Since the temperature and pulse-rate were raised, treatment with sulphamezathine was commenced at once. By 2nd December the patient had all the signs of generalized peritonitis and was treated with penicillin, intravenous fluids and intestinal decompression. Her condition deteriorated and 24 hours later laparotomy was carried out. The uterus formed the centre of a pelvic abscess (Bacillus coli infection); there was no definite evidence of trauma but criminal abortion was suspected. By 9th December the patient was so much improved that chemotherapy was discontinued. Three days later she began to show signs suggestive of a left subphrenic abscess and intermittent pyrexia appeared again. X-ray examination did not confirm this diagnosis but showed a pleural effusion. She then had a moderate leucocytosis (white blood corpuscles 12,700) and cultures from a discharging abdominal sinus revealed a non-haemolytic streptococcus insensitive to penicillin. By 23rd December she continued to have an intermittent high temperature and to show evidence of peritonitis. Culture showed the presence of gram positive cocci and coliform bacilli, both types being sensitive to streptomycin. The wound was then irrigated twice daily with 5 ml. of 1:1,000 streptomycin solution and 300 mgm. of streptomycin was injected intramuscularly every 4 hours for 5 days. The patient rapidly improved but on 29th December the temperature rose again. A small blood transfusion was given for she was then obviously anaemic (Hb. 48 per cent) and a further 5-day course of intramuscular streptomycin was given. By 7th January the temperature was normal and remained so. wound commenced to heal rapidly, the patient being discharged from hospital 2 weeks later.

Miss Liebert pointed out that this case demonstrated the value of working in the closest co-operation with a bacteriologist when treating mixed infections. It was then possible to decide not only the types of organisms present but also their sensitivity to various chemotherapeutic agents. They could then be eliminated one by one until a cure was obtained. Streptomycin might have an

important place in the treatment of these cases in which the organisms are shown to be penicillinresistant. The President said he had no experience of streptomycin in the treatment of this type of infection and pointed out that it was possible that many different antibiotics, prepared possibly from the organisms themselves, may become available in the future.

Sir William Fletcher Shaw (Manchester) read a Note on:

CREDÉ'S EXPRESSION OF THE PLACENTA.

He said that recent experiences had led him to wonder if views and teaching on what constituted Credé's expression had changed. He himself had been taught that it is a method of applying gentle rhythmical stimulation to a sluggish uterus in the third stage, to induce it to contract and so separate the placenta, and only when it is contracting vigorously is it to be squeezed a little harder and the placenta delivered from the vagina by pushing the uterus gently downwards in the axis of the pelvis.

This procedure is open to much abuse by being used too soon and too vigorously, and at an early stage in his career Sir William had realized that a large percentage of the cases of retained placenta are the result of an irregularly contracting uterus produced by a doctor or midwife attempting to save time by improving upon Nature, and that the severe shock which sometimes accompanies retention of the placenta seems in many cases to be due to damage from unjustifiable squeezing of the uterus. For such reasons Sir William had got the impression that in recent years teachers had been chary of advising its use. He was, therefore, surprised to find in a recent higher examination that so many candidates stated that they used this method in the conduct of the third stage, and even more at their description of how they applied it. With one exception they stated that they grasped the fundus and squeezed it as hard as they could, vigorously pushing the uterus down into the pelvis at the same time. When asked to demonstrate the method there was no doubt of the strength they meant to apply, as their faces were strained as in a rugger scrum. In support of his interpretation he then quoted a translaton of Credé's original description of the procedure (Klinische Vortrage uben Geburtshulfe, 1853, Pl. 1, p. 600):

"... Failing natural discharge of the placenta-

. . . In numerous cases, without exception, successful expulsion of the placenta has been obtained within a quarter or half an hour after the birth of the child, by massage through the abdominal wall around the fundus and body of the uterus-gentle at first and gradually increasing in pressure, thus producing an artificially stimulated powerful contraction. When this is at its height I grasped the uterus so that the head lay in the palm of the hand and the fingers and thumb lay along the sides of the organ, exerting a gentle and outward pressure. In each case I felt the placenta slide out of the uterus from under my fingers with such an impetus that it was carried through to the very external genitals; or at least to the lowest parts of the vagina."

Sir William Fletcher Shaw concluded from this description that Credé meant gentle massage to be used, and this for the purpose only of inducing strong contraction of the uterine muscle, the final squeeze being used only to push the placenta from the lower uterine segment and the vagina. Whatever name should be applied to the vigorous method whereby the uterus is squeezed, to use a well known phrase of Lloyd George's applied to another object, "like an orange until the pips squeaked," he did not know, but it certainly should not be Credé. He went on to say that Credé was not strictly entitled to have his name associated with the technique which he did describe, because it had been published in 1767 by John Harvie who wrote:

"... As soon as the child is committed to the care of the nurse let the accoucher apply his hand upon the belly of the woman, which is then very loose, and he will readily feel the contracting uterus; then, having placed the flat of the hand over it, let him by a light and gentle pressure bring it downwards or towards the pubes, and he will feel the uterus sensibly contracting and then feel it so reduced in size as to be certain the placenta is expelled. By this method he will seldom have anything to do afterwards but to help it through the os externum; if even so much remains undone..."

Sir William then reminded the meeting that the history of medicine is full of examples in which the second name rather than that of the originator is attached to various diseases and operations: Credé and Fowler to a manoeuvre and a position described respectively by Harvie and Charles White 100 years

previously, Fothergill to an operation which had already been performed for over 20 years by Donald, whilst Semmelweiss is credited with the discovery 120 years later of what had been described by Charles White and which, curiously enough, had been copied and used to such good effect in Semmelweiss's own hospital by the previous professor.

The President congratulated Sir William Fletcher Shaw on bringing to the notice of the Society a subject on which there was nowadays much confusion. He himself believed that the placenta separated from the uterine wall almost immediately at the end of the second stage, but remained in close apposition, being held there partly at least by the membranes. He deplored the tendency to interfere with the physiology of the uterus in the third stage of labour and expressed the view that an "adherent placenta" was nearly always a separated placenta retained behind a constriction ring. Mr. Racker (Manchester) considered that there was room for liberal views on the physiology and management of the third stage and the rules should not be too rigid. Dr. Newton (Manchester) said that he could not recall carrying out a manual removal of the placenta without finding the placenta still adherent in one area even if it was a small area; and he put in a plea that examiners should not be too harsh on candidates in a qualifying examination who could not be expected to give a perfect description of the treatment of the third stage of labour. Mr. K. V. Bailey (Manchester) said that Credé would certainly not recognize the method which was associated with his name at the present time and, in common with nearly all the speakers he emphasized the need for not interfering with the uterus unless haemorrhage or shock developed. Professor Claye (Leeds) thanked Sir William Fletcher Shaw for bringing the historical aspect of the subject to the notice of the Society. Mr. Calvert (Stockport) said that most teachers nowadays differentiated between squeezing the fundus to separate the placenta and expression of the already separated placenta. Professor Jeffcoate (Liverpool) agreed that this was the general teaching and in order to emphasize it he had been in the habit of avoiding the use of the term "expression" when speaking of Credé's manoeuvre. He said that the translation of Credé's article might be open to different interpretations

and that there still remained some doubt as to what was Credé's technique. He asked Sir William Fletcher Shaw to re-read the translation for the benefit of members. Mr. Fitzgerald (Manchester) also taught that there was a difference between Credé's method and expression of the placenta, while Mr. N. Edwards (Derby) said that if squeezing the uterus ever separated the placenta it should, in theory, be more effective when the uterus was relaxed rather than contracted. All speakers agreed that squeezing the uterus, irrespective of whether it is proper to call it Credé's manoeuvre, is conducive to shock and is dangerous if repeated.

Sir William Fletcher Shaw replied and, as requested, read again the translation of Credé's statement.

# NORTH OF ENGLAND OBSTETRICAL AND GYNAECOLOGICAL SOCIETY.

The fourth meeting of the Society was held in Manchester on Friday, 2nd April, 1948.

The President (Mr. J. E. Stacey) was in the Chair.

Dr. T. Redman (Manchester) described:

AN UNUSUAL CASE OF OUTLET DYSTOCIA

The patient, aged 31, was first seen at the 19th week of her 3rd pregnancy. At the age of 19 she had had a permanent left inguinal colostomy for "congenital incontinence of faeces," but in spite of this her 2 previous confinements had been normal. The colostomy had always worked satisfactorily but about 9 to 12 inches of the lower limb of the bowel had prolapsed through the colostomy opening. This was causing a good deal of aching discomfort and the patient also experienced an unlocalized but distressing pain when the prolapsed loop was handled.

On examination everything seemed normal from the obstetrical standpoint. The anus was represented by a very contracted orifice which would not admit a finger. Vaginal examination was not carried out during the antenatal period. Pregnancy progressed uneventfully and the patient was admitted in labour on 25th January 1948 (expected date of confinement, 2nd February, 1948). The first stage was straightforward but, after the patient had had second stage pains for one hour, and had been co-operating well, it was clear that the foetal head was not advancing. A vaginal

examination was then carried out for the first time and revealed the head low and rotated into the antero-posterior diameter of the pelvis. Beneath it and preventing its descent was a hard, craggy mass, the size of a fist, lying in the hollow of the sacrum. This was presumed to be faecal material lying in the disused rectum and, under general anaesthesia, an attempt was made to push the mass up and deliver the baby with forceps. This was impossible and the operation was abandoned, although the forceps were not removed. The anus was dilated and inspissated faeces were evacuated digitally, a procedure which took 5 minutes. The delivery was then completed easily.

Four days after delivery, Mr. Wilson excised the protruding loop of colon. He detached the colon from its attachment to the abdominal wall by a circular incision round its base, drew out as much redundant bowel as he dared (bearing in mind the danger to the inferior mesenteric artery), divided the mesentery, removed the excess bowel and joined the free end to the stump on the abdominal wall.

The patient was discharged in a satisfactory condition, and breast feeding, on the roth day.

In his comments on the case Dr. Redman pointed out the difficulty in explaining how the mass of faecal material could have collected in the lower bowel, particularly when subsequent enquiry revealed that the patient had had the lower bowel washed out immediately before her 2nd confinement in 1944. He suggested that there may have been migration of material from the upper to the lower opening of the colostomy under cover of the pad which the patient usually kept over them. He also pointed out that the omission to carry out a vaginal examination during pregnancy or during the early part of labour had resulted in late diagnosis of the obstruction to delivery.

The President commented that this unusual occurrence certainly emphasized the need for vaginal examinations and said that rectal examinations in labour, so widely taught and practised, are a relic of the old days when puerperal sepsis was rife. He decried rectal examinations in that the findings are inaccurate and often misleading and considered that vaginal examinations as carried out under present-day conditions involve little risk and should be encouraged whenever there is any doubt about the normal progress of labour. Mr.

Wigley (Chester) said that, with careful observation of the patient and abdominal examination, pelvic examinations are usually unnecessary but believed that under ordinary conditions of practice the time factor is so important that rectal examination in labour still has a place. Mr. Marshall (Liverpool) was in favour of vaginal as opposed to rectal examination and quoted cases where the latter had been responsible for gross errors in diagnosis. Mr. Bailey (Manchester) was also opposed to rectal examinations by either doctor or midwife and said that he taught that every patient should be examined vaginally during pregnancy and also during labour (immediately after rupture of the membranes) when necessary. Mr. Rickards (Manchester) pointed out that rectal examination, by pushing the septic lower vaginal wall against the cervix, also involves risk of infec-

Dr. D. C. A. Bevis (Manchester) described a case of

# Ectopic Pregnancy in a Tuberculous Fallopian Tube.

The patient, aged 32, first attended complaining of sterility. She was married in 1944 and had had an operation for tubal pregnancy in 1945. Her general health seemed good. No gross abnormality was found on pelvic examination. Before arrangements for her further investigation were completed she attended again, having had slight bleeding for 31/2 weeks commencing one week after a period had been expected. The bleeding had ceased and although the possibility of ectopic pregnancy was considered, an early intrauterine pregnancy seemed the more likely diagnosis. Three days later on 28th November, 1947, she had a sudden attack of severe pain in the right side associated with vomiting and faintness. admission the pain was less severe and was intermittent; blood-pressure, 120/70; temperature, 99.0°F.; pulse 100. The breasts were secreting slightly, there was considerable tenderness in the right iliac fossa. On vaginal examination the absence of any bleeding was noted and also diffuse tenderness. White cell count: 9,000 per c.mm.; 71 per cent polymorphonuclear cells. A provisional diagnosis of pelvic peritonitis was made and treatment with penicillin and sulphamezathine was commenced. The following day the temperature was 100°F, and intermittent pyrexia continued;

5 days after admission the patient began to cough. On 5th December, 1947, she had slight vaginal bleeding and had more pain in the right iliac fossa; the spleen was then palpably enlarged and she still had a high temperature. Vaginal examination suggested the possibility of a mass high up behind the uterus. Conditions such as typhoid fever were seriously considered, but before transferring the patient to a medical ward it was decided to carry out an examination under anaesthesia. After this examination the patient collapsed, and it was evident that she had an intraperitoneal haemorrhage so, after blood transfusion, laparotomy was performed by Dr. Scott Russell. A large ectopic pregnancy was found in the ampulla of the left Fallopian tube and was lying high up behind the uterus. Left salpingectomy was carried out. The right Fallopian tube had been removed previously and there were no adhesions in the pelvis. following day she appeared comfortable and continued to improve until 10th December, 1947, when her temperature rose to 103°F. and she complained of cough. Examination of the chest again gave negative findings. The temperature continued to swing between 98° and 101°, and on 13th December, 1947, she complained of pain in the right side of the chest. Antiphlogistine was applied with some relief but the condition remained unchanged. Two days later the liver and spleen were again just palpable and a provisional diagnosis of undulant fever was made. The abdominal wound was well healed and she was transferred to a medical ward where it was established that she was suffering from active miliary tuberculosis. She responded well to treatment with streptomycin.

The specimen removed at operation consisted of an unruptured Fallopian tube containing placental tissue and a large amount of blood clot; an embryo 15 mm. in length was found in the blood clot. Histological examination of the material showed the presence of tuberculous salpingitis with well defined giant cell systems. The plicae of the tube were grossly swollen and adherent chorionic villi were present in the lumen. Sections of the embryo showed no obvious abnormalities.

Dr. Bevis pointed out that the association of tuberculous salpingitis and tubal pregnancy is rare. Stevenson and Wharton (1939) give the first account of the condition in English, and Bland, in 1940, collected 32 cases from the literature and was able

to add a case of his own. A search of the literature from 1939 revealed a further 7 cases. In the reported cases the presence of tuberculosis was nearly always unsuspected and was only diagnosed on histological examination. Although tuberculous salpingitis is accepted as being a cause of absolute sterility, a number of the case reports indicated that the women had already been pregnant but the interval seems to have been more than 5 years. Sterility may be due to obliteration of the fimbriated end of the Fallopian tube from coalescence of the mucosal tissue or to the destruction of the primordial follicles by an associated tubercular oöphoritis (Stevenson and Wharton, 1939).

Dr. Bevis concluded that the enlargement of the liver and spleen in his case was explained by a generalized miliary spread of the disease following pregnancy. The suggestion that pregnancy is responsible for the occurrence of recrudescence of active disease in the Fallopian tube is supported in this case by the fact that no tubercles could be demonstrated in the muscular layer of the tube. The primary focus of infection is unknown, however, as the previous medical history of this case gives no indication of a pulmonary lesion.

The President commented on the frequency of tuberculous salpingitis and said that it is probably not always a cause of absolute sterility as is often supposed. He also pointed out that it is not uncommon for evidence of tuberculosis to be found during the histological examination of Fallopian tubes which showed no naked-eye changes suggestive of the disease. Professor T. N. A. Jeffcoate (Liverpool) agreed that the pathological changes in tuberculous salpingitis vary considerably and depend possibly on the method whereby the tubes become infected. In some cases the tubes present a dull-red congested and oedematous appearance without being obstructed and without being involved in adhesions. Sometimes in patients suffering from endometrial tuberculosis the Fallopian tubes can be shown to be patent by hysterosalpingography. Nevertheless he believed sterility associated with genital tuberculosis is more often due to tubal damage than to failure to ovulate. Dr. Paine (Sheffield) agreed that the Fallopian tubes sometimes have an oedematous congested appearance without any other obvious naked-eye change, but pointed out that the site of

the obstruction may be in the interstitial part of the Fallopian tube only and may be overlooked.

Mr. H. B. Bagshaw (Liverpool) described a case of

### JAUNDICE IN LATE PREGNANCY

A woman, 37 years of age, had been married 5 years and had had 1 abortion. She was first seen on 18th October, 1946, at the 18th week of her 2nd pregnancy (last menstrual period: 20th June, 1946). She had had scarlet fever at the age of 3 but no other significant ill-health. Morning sickness had been present during the first 10 weeks but otherwise she had been well during the pregnancy. Examination did not reveal any abnormality; blood-pressure 115/70 mm. Hg; urine normal; Wassermann reaction, negative; uterus 18 weeks in size.

The patient paid 4 subsequent visits to the antenatal clinic the last being on 24th January, 1947, and at that time she was 32 weeks pregnant and well in every respect. Urine normal; blood-pressure 128/80. On the evening of the following day she was taken suddenly ill, the first symptom being an attack of dyspnoea. She was attended by her own doctor who apparently did not regard her condition as being serious at first and did not order any special treatment. He referred her to hospital 2 weeks later, on 9th February, 1947.

The patient stated that for 10 days prior to admission she had had considerable vomiting, and that on the day of admission the vomit had been coffee-ground, her feet and legs had been swollen for 10 days, her urine had been dark and muddy for a week, her stools had been pale for a few days and she had had epigastric pain for a day. On admission the patient looked extremely ill. There was deep jaundice of the skin and of the sclerotics. The tongue was dry as parchment and fissured. The gums were bleeding. The temperature was 98°F. The pulse-rate was 112 per minute and the respiration rate was 20 per minute. The bloodpressure was 165/105 mm.Hg. The urine contained a large amount of albumin and also bile pigment. There was an erythematous papular rash on the lower extremities and over the arms, which disappeared on pressure. There was gross pitting oedema of the lower extremities. The uterus was enlarged to the size of a 34-weeks pregnancy. Foetal parts could be felt without difficulty and the uterus was not tender. The foetal head was presenting and a third of it was engaged in the pelvis. The foetal heart could not be heard. The liver was not palpable.

A provisional diagnosis of acute yellow atrophy with intrauterine death of the foetus was made and it was decided to induce labour immediately by artificial rupture of the membranes. Intravenous medication with 5 per cent dextrose in normal saline, protein hydrolysate and 10 per cent calcium gluconate was also commenced. A stillborn; not macerated male foetus, weighing 4 pounds 12½ ounces, was delivered at 6.10 a.m. the following morning. The third stage of labour was normal, but blood clot weighing 12 ounces was expressed with the placenta and membranes. Immediately after delivery the blood-pressure fell to 130/60 mm. Hg.

A few hours after delivery the patient's condition appeared desperate and 4 obstetricians who saw her all expressed the opinion that death was imminent. She was deeply jaundiced, had increased vomiting and became very drowsy with occasional muscular twitchings and attacks of hiccough. However, within 24 hours her condition began to improve, the gums ceased to bleed, the jaundice gradually faded and was not apparent after 3 weeks, the rash disappeared and the oedema subsided. The puerperium was afebrile and the patient was discharged symptom-free 1 month after admission.

Intravenous therapy was given continuously during the first 4 days after admission, and in all she received 8½ litres of 5 per cent dextrose saline and 2 litres of protein hydrolysate in 5 per cent dextrose, together with 25 units of insulin. She was also given 10 ml. of 10 per cent solution of calcium gluconate, intravenously, and 20 mgm. of Vitamin K analogue intramuscularly, daily, for the first 6 days. The diet was fat-free until the bile disappeared from the urine. In the first 24 hours her fluid intake was 81 ounces and her output (urine and vomit) was 14 ounces. In the second 24 hours the intake was 138 onnces and the output 62 ounces. In the third 24 hours the intake was 140 ounces and the ontput 82 ounces. In the fourth 24 hours the intake was 128 onnces and the output was more than 66 ounces. The blood-pressure never rose above 165 mm. Hg systolic and was within normal limits during the last fortnight the patient was in hospital. At first there was a large amount of albumin in the nrine with red-blood corpuscles and an occasional granular cast. Albuminuria was still present when she left hospital.

A considerable number of biochemical tests were carried out and Mr. Bagshaw showed charts of the results of these. At first the blood urea and blood uric acid estimations and thymol turbidity test all gave high readings and there was much flocculation in the cephalic cholesterol test. These findings collectively indicated extensive liver damage.

The patient was seen on 4 occasions at the postnatal clinic, the last being on 26th January, 1948. She is now well and free from symptoms. Cholecystography shows a normal gall bladder. Liver function tests give normal readings. The blood urea figure remains on the high side of normal, but she has persistent slight albuminuria and slight hypertension (145/95).

Mr. Bagshaw in discussing the case said that it was difficult if not impossible to make a definite diagnosis because liver biopsy was not undertaken. Nevertheless the clinical features pointed to a severe toxaemic condition rather than to infective hepatitis, and the most likely diagnosis was obstetric acute yellow atrophy of the liver as described by Sheehan. In this condition the pathological change in the liver is sometimes reversible and the chief hope lies in intensive glucose therapy. If the diagnosis is correct in this case then treatment may have something to do with the patient's recovery.

In conclusion Mr. Bagshaw referred to the prognosis in the event of future pregnancies, pointing out that although this woman now appeared to have normal liver function, he had so far advised against pregnancy because of persisting albuminuria and hypertension, and because of poor renal function as shown by the urea clearance test.

The President congratulated Mr. Bagshaw on the successful treatment of this case and said that the result should encourage others to persist with intensive treatment even in apparently hopeless cases. Dr. S. B. Herd (Liverpool) recalled 2 similar but milder cases, in both of which the woman had recovered. Mr. C. H. Walsh (Liverpool) pointed out the value of the newer liver function tests in the study of these cases, whilst Dr. Racker (Manchester) emphasized the need for administering protein as well as glucose. Dr. Paine (Sheffield) gave an account of a similar case in which the

patient also had eclampsia. The serum protein dropped to 4.4 mgm. per cent and the patient was treated successfully by plasma transfusion and large doses of vitamin B. Mr. Liggett (Blackburn) also mentioned 2 similar cases, one in which the woman recovered and the pregnancy continued with the ultimate live birth of a premature foetus, and one in which a woman, jaundiced and comatose, ultimately recovered and that in spite of many other complications such as streptococcal infection and thrombophlebitis.

Mr. C. M. Marshall (Liverpool) reported three unusual cases which were illustrated by colour film.

The first was a spinster of 68 suffering from intraepidermal carcinoma (Bowen's disease) of the Her sole complaint was of unpleasant irritation of the vulva for 18 months. The labia and a butterfly area some 5 cm. beyond were the site of a reddish brown and slightly raised "flush" with a well-defined and, in places, quite palpable edge. There was not vaginal involvement and the perineum was hardly affected. The labium minus was the site of a small leukoplakic patch. surface of the affected area was dry and palpation caused shallow fissures to appear, which bled slightly. Acting on the clinical diagnosis alone the vulva was excised, and examination revealed histological findings typical of intra-epidermal carcinoma. There was no recurrence at the time of the report, 2 years after the operation.

The next was a case of delivery through the posterior vaginal fornix. The patient, aged 28 and a para-2, was first seen a few months after the delivery of her second child when she was complaining of prolapse of the uterus and profuse bloodstained vaginal discharge. Occupying the posterior fornix and the back of the cervix to within 4 cm. of the external os there was a roughly circular crater-like ulcer some 5 cm. in diameter. There was a fistulous opening in its base through which a sound could be passed into the uterus. The distal portion of the cervical canal was patent and the external os presented all the features of a nulliparous orifice. It was learned that the 2nd delivery had occurred easily. At her first confinement 2 years previously the midwife had summoned a doctor when the patient could not deliver herself, though the head was partially crowned. He incised a membrane over the head which he stated was not the foetal membrane and delivered with forceps.

Mr. Marshall considered that this was a case of true rigidity of cervix and os, though it might conceivably have arisen from pregnancy and labour occurring in a retroverted uterus which had undergone anterior sacculation. The prolapse was cured by the Fothergill type of operation, the cervical amputation being high enough to include the "ulcer" and fistulous opening. The specimen was shown.

The last case illustrated an obstetric complication of vaginal fixation of the uterus during a repair operation between the 4th and the present pregnancies. The patient, 37 years of age, was admitted at term with ruptured membranes and the foetus lying transversely. Under anaesthesia a foot was easily secured and drawn through a 2-finger cervix, but it was found impossible to bring about any alteration in the lie of the foetus. It was noted at the time that a tense band could be felt arising in the anterior fornix and running upwards in the midline towards the body of the uterus. When, at the end of 20 hours, labour had not begun, the foetus had died, and the pulse rate was rising, the abdomen was opened and hysterectomy with the foetus in situ was carried out. On opening the abdomen the superior border of the uterus was found deeply depressed in the centre (fundus) and actually at a lower level than its lateral portions (lateral borders), thus giving the organ a bilobular appearance. The fundus was found to be anchored by a strong band of fibrous tissue of 2 fingers' breadth proceeding upwards from behind the bladder and carrying with it a tongue-like process of the latter to be inserted by a broad expansion into the fundus of the uterus a short distance below its highest point. A finger could be passed between this anchoring band and the front of the lower segment. tongue of the bladder was dissected free, and the band dissected off the fundus. Before this was done it was impossible, even with the abdomen opened, to turn the child. As soon as its anchoring band was released, the fundus ascended and spontaneous cephalic version occurred. The band could only have arisen by passing one or more of the vaginal sutures through the cul de sac of the uterovesical peritoneum so often seen after pushing up the bladder in repair operations. Or in this case it is possible that a more exact procedure of vaginal fixation of the fundus had been carried out after deliberately opening the uterovesical pouch as is

practised by some gynaecologists. The patient's recovery was uneventful.

The President referred to the occurrence of transverse lie in some types of bicornute uterus and said that in the last case the post-operative band produced a similar kind of uterine deformity. Professor Jeffcoate (Liverpool) referred to 2 cases of Bowen's disease of the vulva, previously published but not reported to the Society, pointing out some of the histological features. He said that although the naked-eye and microscopic appearances are characteristic, the diagnosis is not always easy.

THE Fifth Meeting of the North of England Obstetrical and Gynaecological Society was held at the Royal Victoria Infirmary, Newcastle, on Friday, 4th June, 1948, with the President (Mr. J. E. Stacey) in the Chair.

Mr. Stanley Way (Newcastle) described:

#### A VARIANT OF MEIGS'S SYNDROME

The patient, a 5-para, was aged 61 according to herself and 65 according to her relatives. She had menstruated regularly, 3/28, until 2 months before admission.

In 1941 she first noticed swelling of the abdomen and her doctor carried out paracentesis and arranged for her admission to a hospital. There she was evidently thought to be suffering from a malignant condition and no active treatment was carried out. Between 1941 and 1943 paracentesis was carried out 17 times and she gradually became weaker, her weight falling from 151/2 to 63/4 stones. When examined in 1943 she was found to have ascites and a large solid tumour in the right half of the lower abdomen. She also had a bilateral hydrothorax, greater on the right than the left. By this time, too, she had developed gross uterine prolapse with complete inversion of the vagina, while the rectal mucosa was prolapsed 4 inches. A diagnosis of Meigs's syndrome was made and, after withdrawal of one pint of clear strawcoloured fluid from the right pleural cavity, laparotomy was carried out on 12th April, 1943. The large tumour on the right side of the pelvis was then found to consist of 2 tumours closely associated with each other. One was cystic and had the fimbriated end of the Fallopian tube stretched over it; this proved to be an ovarian cyst with intracystic papillae. The larger solid tumour was extra-peritoneal within the layers of the broad ligament, adherent to the right wall of the bladder, and was subsequently shown to be arising from the round ligament. It was lifting up the peritoneum and displacing the uterus to the left. Its only blood supply was from a large artery in the round ligament. Both tumours were easily removed and the patient made a good recovery. Repeat X-ray examination 2 weeks later demonstrated complete disappearance of the pleural effusions.

Histological examination of the solid tumour showed a fibrous stroma infiltrated with adenocarcinoma. The tumour was reported as being a well differentiated one, practically free from nuclear irregularities and mitotic figures but clearly infiltrating small blood vessels and lymphatics. Its exact nature has never been clearly ascertained. No other primary growth was discovered and it must be assumed, if this was a true carcinoma, it had probably been primary in the fibroma.

The patient's response to treatment was satisfactory. She commenced to gain weight and resumed her household duties for the first time in 2½ years. In October 1943, the utero-vaginal and rectal prolapse was repaired, again with a good result. The patient remains well more than 5 years after the initial operation. Her weight is about 15 stone. She is active and walks about 4 miles a day. The patient herself, apparently in good health, was shown to members of the society.

This case presents several interesting features, not the least of which is the curious nature of the tumour. It shows once again the importance of exploring cases of suspected malignant ovarian tumour with ascites, no matter how hopeless they may appear to be. This point was first brought out, not by Meigs, but by Lawson Tait as long ago as 1882, when he said that occasionally solid ovarian tumours associated with fluid in the abdomen and chest proved to be benign and he appealed at that time for a more radical attitude towards this type of case, so that these patients may not be condemned to many years of misery when in actual fact they can be cured.

There is no obvious explanation as to why this patient continued to menstruate until the age of 61, and unfortunately endometrial biopsy was not carried out at the time of the operation.

Mr. Way went on to point out that although fibromata are the most common tumours to be associated with Meigs's syndrome, it may occur in the presence of other ovarian tumours. He considered this case to be unique in so far as it is the only recorded case of an extra-peritoneal tumour causing the syndrome.

The President commented on the many interesting features of the case and suggested that displaced ovarian tissue might be the source of origin of the solid tumour. Professor T. N. A. Jeffcoate (Liverpool) asked why it was assumed that the extra-peritoneal solid growth, rather than the intraperitoneal cystic one, was the cause of the ascites. Mr. Way replied that the possibility of the cyst being responsible could not be excluded.

Mr. T. G. Robinson (Newcastle) described:

# Two Cases of Full-time Extrauterine Pregnancy.

CASE I.—Mrs. McF., age 33, I-para, was admitted as a case of toxaemia of pregnancy. The exact duration of pregnancy was unknown. She had hypertension and albuminuria and after one week's conservative treatment it was decided to induce labour. The foetus appeared at term by size, its position was R.O.A. and the foetal heart was heard. On an attempt being made to rupture the forewaters the uterus was found to be empty—a finger could be passed through the cervix up to the fundus.

It was decided to delay operation for 12 hours while chemotherapy was commenced and X-ray examination carried out. During the interval the foetal heart ceased to beat. At operation the gestation sac was opened through a bloodless area and a 7-pound male stillborn foetus removed. The placenta, which was attached to the posterior layer of the broad ligament and the pouch of Douglas, was not disturbed and the abdomen was closed without drainage. The patient made an uninterrupted recovery.

This patient, operated on 2 years previously, was shown at the meeting and the placental mass, although continually decreasing in size, was still palpable in the hypogastrium.

CASE 2.—Mrs. R., age 33, 3-para, was admitted as a case of antepartum haemorrhage on 23rd December, 1947. In early September she had attended the hospital clinic complaining of irregular periods and some lower abdominal pain. She

then appeared to be 16 weeks pregnant and no abnormality was noted. She did not see a doctor again until the time of the haemorrhage which brought about her admission to hospital. At examination on 30th December, 1947, the pregnancy appeared to be near term and there was a good deal of abdominal tenderness. The temperature and pulse-rate were raised and, since the patient admitted attempts to "get rid of the pregnancy", a tentative diagnosis of peritonitis was made and chemotherapy commenced. The patient's condition improved until 13th January, when she suffered acute abdominal pain accompanied by a rise in temperature and pulse-rate. The possibility of extrauterine pregnancy was then entertained and the diagnosis confirmed by hysterosalpingography. At operation the same day a macerated foetus with wry-neck and weighing 7 pounds 5 ounces was delivered from sac. As soon as it was lifted out severe haemorrhage commenced from the placental site on the posterior abdominal wall. This was controlled initially by pressure applied by the assistant and, after closure of the abdomen, by pads and binder. Blood transfusion was commenced at once and in all 5 pints were given. The amount of bleeding at first was enough to cause real anxiety but the patient's condition slowly improved and she was discharged from hospital 44 days after operation.

In this case there was evidence of haemorrhage occurring before operation and this recurred as soon as the pressure of the foetus was removed—and that despite the fact that care was taken not to disturb the placenta. This patient was also demonstrated at the meeting and the placental mass was easily palpable.

Mr. Robinson went on to give a brief review of the literature dealing with advanced abdominal pregnancy, pointing out the progress made in treatment in recent years. Nowadays with the practice of leaving the placenta and closing the abdomen, together with blood transfusion and chemotherapy, the mortality has been reduced to reasonable proportions. Some authors still advise removing the placenta if it is technically easy but the difficulty is to decide which placenta can be safely removed without first taking the risk of disturbing its attachment. The chief hope for the foetus in these cases lies in early diagnosis, but here the difficulty is that the clinical signs vary considerably

from case to case and the experience of any one surgeon is limited by the rarity of the condition. Many of the deformities described are of the acquired type and due to the unusual attitude which the foetus may adopt. If the child survives these may correct themselves or be amenable to treatment later.

The President referred to his experience of 3 cases of advanced ectopic pregnancy. In one of these, in which he had left the placenta in the abdomen, he operated again 15 months later for secondary abdominal pregnancy. At that time there was no sign of the placenta remaining from the first pregnancy. Mr. F. Stabler (Newcastle) pointed out that, although it is a good general rule not to remove the placenta, in some cases the placenta is almost pedunculated and can be removed easily and safely. Mr. F. Burke (Sunderland) agreed and said in one such case he found a rudimentary uterine horn in relation to the placental pedicle. In a second case of a full time broad ligament pregnancy the placenta was inadvertently partially separated and the resulting haemorrhage necessitated packing and marsupialization of the sac. The patient died 12 hours later. Professor Farquhar Murray (Newcastle) said there was no advantage in marsupialization of the sac and also mentioned one case in which the whole placenta was retained within the Fallopian tube although the foetus was within the abdomen. Mr. Scott Russell (Manchester) thought that it was unwise ever to advise removal of the placenta at this type of operation. Dr. Newton (Manchester) gave an account of I case in which the placenta, not disturbed at the time of the operation, was discharged through the abdominal wound on the 10th day. Mr. Jeaffreson (Leeds) said he had experience of 3 cases of abdominal pregnancy and pointed out that contrary to the textbook description it is often unusually difficult to palpate foetal parts. Dr. Herd (Liverpool) said that in this, as in many other conditions, once the decision to operate has been take it should not be deferred even a few hours. Mr. Bryan Williams (Middlesbrough) emphasized that even when the greatest care was taken haemorrhage was not always avoidable and described operating on a case of a 16 weeks' abdominal pregnancy in which the placenta separated spontaneously at the time of operation and resulted in the most alarming loss of blood which was only controlled by packing.

Both Mr. Stabler (Newcastle) and Mr. Harvey Evers (Newcastle) had seen cases in which the child had been delivered alive but died subsequently.

Mr. Robinson replied, agreeing that abdominal palpation of the foetus can be difficult in these cases and emphasizing that, although there may be a few cases in which the placenta can be safely removed, it is difficult to know which they are without taking a great risk at the time of operation.

Mr. Linton Snaith (Newcastle) read a paper on:

THE USE OF OESTROGENS IN UTERINE INERTIA. .

He pointed out this was by way of a preliminary note based on recent clinical experiments. After reviewing the literature dealing with the changes in the level of oestrogens in the blood and urine during pregnancy, abortion and labour he went on to mention some modification in views on the actions of oestrogens which had come to light recently. Thus, contrary to the traditional view, it is even suggested by some workers that oestrogen injection can postpone the onset of parturition in some animals, and that increased uterine activity may be the result of oestrogen withdrawal. Despite the inconclusive evidence provided by animal experiments there is a fairly widespread belief that oestrogens are effective in stimulating the uterus to evacuate a dead pregnancy, for induction of labour and in the treatment of inertia. In considering the use of oestrogen for such purposes it is important to bear in mind the problems raised by what is known about the metabolism of these substances, their inactivation and excretion. Also, and possibly having some bearing on these problems, is the question of the route of administration. Since oral administration and the intramuscular injection of oestradiol esters in oil make for slow absorption they may have considerable disadvantages where the treatment of inertia is concerned. Loeser has recently described a rapid vascular change in the endometrial bed following the intravenous injection of oestrogen and it seemed possible that this route might be preferable where induction of labour or treatment of inertia is concerned. A clinical trial was therefore carried out, using oestradiol in propylene glycol, 25 mg. per c.cm.

An attempt to induce labour was made in 10 cases at or near term. In one case the membranes were already ruptured and labour started half an

hour later. In one other case expulsive contractions commenced 5 hours after the injection, but in the remainder labour did not begin for 32 to 164 hours after treatment, and then usually after artificial rupture of the membranes.

Nine cases of uterine inertia were also treated. In all cases the membranes were already ruptured. The duration of labour varied from 7 to 52 hours. All patients had had feeble "pains". A total of 125 mg. of oestradiol was given in each case, either in 1, 2, or 3 injections. In 1 case after 40 hours of ineffective labour there was an improvement in contractions half an hour to an hour after injection, and subsequent labour lasted if hours. In one other case strong backache occurred for about an hour, coming on half an hour after the injection. but the backache subsided and ultimately Caesarean section was carried out after 75 hours delay because of a breech presentation in an elderly primigravida. In 4 other cases improvement in contractions occurred after a lapse of 2 hours or more, but one of these also had Pitocin in one-unit doses hourly into an intravenous drip. In 2 other patients, who had reached 2 to 3 finger dilatation after 20 hours or more, the intravenous injection produced no effects whatsoever and delivery took place 30 hours or more later, in one case by Caesarean section. None of the patients experienced untoward symptoms following the intravenous injection, although some experienced a sensation of heat in the arm.

Mr. Linton Snaith concluded that in these series of experiments there was no convincing evidence that the uterus had been sensitized by oestrogens. When improvement in uterine function did occur the time lag was extremely variable, from o to 24 hours. Moreover his experience of using stilboestrol either before or during labour led him to the view that it does not significantly influence the onset of labour or the quality of contractions during labour. Finally he pointed out that, although inertia has different causes, the important thing is to make the uterus contract efficiently, and if oestrogens have the action which is claimed for them they should be of value in all cases.

The President said that he, in common with most obstetricians, had used stilboestrol and other oestrogens both for induction of labour and for inertia. Although an apparently good effect was sometimes seen he had never been completely con-

vinced of their value. Professor T. N. A. Jeffcoate (Liverpool) said that some of his earlier work and writings in this respect were often quoted, but not always correctly. In the past he had perhaps been rather too enthusiastic; yet any claims and observations he had made had been cautious. Although the value of oestrogen therapy in cases of intrauterine death of the foetus seemed reasonably certain, further experiences of its use in inertia made him even more sceptical of its efficacy. One of the difficulties is to justify the treatment on theoretical grounds. In the first place the majority of cases of inertia have a nervous or mechanical cause and in these it is not reasonable to expect a good result. Even if an endocrine upset is ever to blame there remains the difficulty that oestrogens are not oxytocic in the ordinary sense and animal experiments go to show that it takes at least 12 hours for uterine contractions or sensitivity to be influenced. The maximum effect of oestrogen is only obtained after 4 to 5 days, and that after repeated administration. In his view the intravenous route did not counteract the time lag. Indeed, it is doubtful whether an immediate change in uterine function should ever be regarded as a successful response. He went on to say that he too had used intravenous injections of oestradiol in propylene glycol both during pregnancy and labour, using repeated injections of 125 mg. each, and once giving as much as 500 mg. in a single injection without the patient suffering ill effect. Some injections had been given at the time of operation with the uterus under direct vision. He had never seen any obvious change either in vascularity or activity of muscle during the time of observation or during operations such as hysterotomy or Caesarean section. Nor had any cases of uterine inertia or inco-ordinate uterine action been definitely benefited although, as with any form of treatment, some had appeared to be-if only temporarily.

Dr. R. Newton (Manchester) said he had found oestrogens appear to improve uterine function in some cases but their action was inconstant. He had got the impression that they sometimes resulted in painless labour when given in late pregnancy. He also pointed out that prolonged labour is not necessarily pathological. Mr. Scott Russell (Manchester) emphasized the different types and causes of inertia and said that some may not

be pathological. Professor Farquhar Murray (Newcastle) also said that a long first stage with intact membrane is of little consequence, Mr. Harvey Evers (Newcastle), however, pointed out that contrary to the usual statement the foetus may suffer harm during prolonged labour even while the membranes are intact. Mr. Linton Snaith replied and said that unduly prolonged labour could never be regarded as completely normal. It required treatment not only in the immediate interests of the mother and child, but keeping in mind its possible effects on future childbearing.

Mr. Stanley Way (Newcastle) read a paper on:

INFARCTION OF THE UTERUS

The uterus, without doubt, had one of the best vascular supplies of any organ in the body and therefore infarction was extremely difficult to produce. Nevertheless, in certain circumstances it could occur, although these were very rare. The literature contained practically no mention of this condition, but in the last 12 years he had met with 4 examples, all of different actiology. He would make clear at the outset what he meant by infarction. The word infarct was usually reserved for a localized area of necrosis resulting from the cutting off of the blood supply to that particular area. When, however, a wide area of tissue was filled with multiple small infarcts often only reconizable as infarcts when seen through a microscope, the word necrosis was frequently applied to this condition. In this paper there were examples of both types and he had used the term infarction somewhat loosely to cover both types of necrosis.

The first case was tragic and occurred some 12 years ago. A woman of 21 years was admitted almost moribund with gangrene of both feet. She had been confined at home 4 weeks previously and the doctor had prescribed I dram of liquid extract of ergot twice daily for 2 or 3 days. In error the patient had been given I ounce twice daily for 3 weeks. The patient died shortly after admission and autopsy revealed generalized contraction of bloodvessels, many of them containing thrombi. There were multiple infarcts throughout the body. The uterus was completely involuted, all 4 main vessels contained organized thrombi, and the uterus itself was turned into a solid infarct which on section was structureless. Here was an example of a chemical agent producing arterial spasm and thrombosis resulting in infarction.

The second case concerned a woman of 58 admitted in 1942 with acute abdominal pain and vomiting of 12 hours' duration. She had a tender mobile mass in the lower abdomen, and at operation this proved to be a uterine fibroid which on account of gross elongation and atrophy of the supravaginal cervix, had caused axial rotation of the uterus through more than a complete circle, carrying with it both ovaries. All 4 vessels were completely strangulated and showed recent clots in their lumina, and the uterus was plum-coloured and necrotic. The patient made a good recovery A more extreme after subtotal hysterectomy. example of this was described some years ago by Bastianelli in which, following rotation and infarction, spontaneous amputation occurred, leaving the uterus free in the abdominal cavity. This was an example of infarction due to mechanical obstruction to the blood supply.

In 1944 a woman aged 35 was admitted to the Maternity Hospital with a diagnosis of threatened abortion. She was 14 weeks pregnant and had had slight vaginal bleeding for one week prior to admission. She had had one normal delivery 5 years previously. On examination there was only slight vaginal bleeding and the os was closed. The only other abnormal finding was that her bloodpressure was 180/120. Ten hours after admission she complained of sudden abdominal pain, collapsed and died all in the space of about 10 minutes, and just before she died she expelled from the vagina a complete ovum. At autopsy she was found to have an extensive atheroma of the aorta and of the renal arteries, and many of the smaller vessels. The left ovary and the left cornu of the uterus were completely infarcted and the left ovarian artery showed a considerable degree of atheroma and contained a fresh thrombus which extended into the finer ramifications of this vessel and presumably prevented thereby any collateral circulation from the opposite ovarian or the uterine arteries. The actual cause of death was acute heart failure. Both kidneys were extensively damaged by ischaemic changes and showed several old infarcts. This was an example of vascular disease producing thrombosis and consequent infarction.

In the 4th case a woman of 58 complained of vaginal haemorrhage and the only positive finding was a soft patulous and irregular cervix. Under anaesthesia the cervix appeared gangrenous and a

portion taken for section showed thrombosis of the small vessels and extensive septic infarction. A few days later the patient confessed that a week prior to her first attendance at hospital her cervix had prolapsed and she had taken a pair of scissors and tried to cut it off. She succeeded in getting a small piece off but a fierce haemorrhage had caused her to desist. Seven days after admission she developed severe pain in the left iliac fossa. She then appeared ill and the uterus felt considerably enlarged. In the left broad ligament close to the uterine cornu was a thickening which had not been there before and which was exceedingly tender to the touch. On these findings, and in the light of previous experience, a diagnosis of thrombosis near the left cornu was made and total hysterectomy carried out. A large vessel at the left cornu was thrombosed, and the endometrium over that area was gangrenous. Section of the cut edge of the fundus showed an extensive area of superficial necrosis and probably even more infarction would have occurred if operation had been deferred. Culture from the cavity of the uterus showed anaerobic streptococci and Clostridium welchii. After hysterectomy and, with the aid of sulphonamides, the patient made an excellent recovery. This was an example of thrombi caused by a septic process, which probably started as a result of the patient's self-interference, and was spread by the biopsy

We thus had 4 ways in which thrombi might be formed; a chemical agent, mechanical obstruction, vascular disease, and a septic process. In an organ with such a good blood supply as the uterus total

infarction must be extremely rare, and its power of recovery from anything short of total vascular occlusion must be extremely good. The circumstances pertaining to all these cases were rare and unusual, and it was little wonder that the literature was so silent about what must be a rather uncommon manifestation.

The specimens from cases 2, 3 and 4 were shown.

The President said that, as compared with other types, septic infarction and necrosis was the most common and he thought this kind of lesion was often the basis for the cases of persistent sub-acute cellulitis sometimes seen. He asked how it was possible to diagnose infarction. Dr. R. Newton (Manchester) referred to cases of criminal abortion induced by injecting caustic alkalis and resulting in massive gangrene or infarction of all the pelvic organs. He as well as Professor Farquhar Murray (Newcastle) asked whether concealed accidental haemorrhage was to be regarded as infarct? Mr. Way replied, saying that the essential point in diagnosis, as in the diagnosis of infarcts anywhere in the body, was the sudden onset of excruciating pain. Concealed accidental haemorrhage was not infarction but consisted in extravasation of blood. The extensive necrosis and gangrene sometimes seen in cases of criminal abortion and puerperal sepsis was not quite in the same category as the cases he had described. He regarded them as necrosis which was probably due to the infection itself, whereas his paper was mainly concerned with localized necrosis following ischaemia due to septic thrombosis.

## REVIEW OF CURRENT LITERATURE

The Journal is fortunate in being able to run this Review in conjunction with the Abstracting Service of the British Medical Association. All the abstracts of this service which cover obstetrical and gynaecological literature and literature on the new-born are at our disposal. The Review will, however, contain in addition abstracts and titles of articles which, though not of sufficient general interest for publication in the monthly volumes published by the British Medical Association, are yet sufficiently important for a specialist journal. It is to be hoped that our readers will collaborate in the preparation of these abstracts. Those who are willing to take part in the service are invited to communicate with the Editor, The Abstracting Service, B.M.A. House, Tavistock Square, London, W.C.I. There is special need of abstracters in foreign languages, and when offering his or her services the writer should indicate the language (apart from English) in which he or she is proficient. The name of the abstracter will be acknowledged in the text and payment will be made at the rate of ten shillings per abstract for English articles and twelve shillings and sixpence per abstract for articles from foreign languages.

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### ANATOMY.

1016. A Simple Pelvimeter to be Used with the Triangulation Method to Pelvimetry.

By T. A. KENDIG. *Radiology*, **50**, 395-399, Mar. 1948. 3 figs., 2 refs.

1017. Observations on Foetal Hysterosalpingography. (Ricerche di isterosalpingografia fetale.)

By I. CESA. Radiologia, Roma, 8, 605-613,

1947. 6 figs., 6 refs.

This work, carried out at the Institute of Medical Radiology of the University of Rome, largely confirms and amplifies our knowledge of the anatomy of the uterus and Fallopian tubes in the foetus and new-born. It describes in detail the relation between the body and cervix of the uterus, the insertion and direction of the tubes, and the several types of malformation of the uterus. The proportion of such malformations in the foetus is higher than that usually accepted in adults. In two-thirds of the cases both tubes were patent, in 13 per cent only one tube was patent, and in 20 per cent both tubes were closed. The author admits, however, that non-patency on injection of an opaque substance did not necessarily always mean congenital occlusion.

1018. Spiral Arteries in the Human Ovary.

By B. Delson, S. Lubin, and S. R. M. Reynolds. *Endocrinology*, 42, 124-128, Feb. 1948. 3 figs., 8 refs.

1019. The Relationship of the Vagina to Adjacent Organs in Reconstructive Surgery. A Histologic Study.

By J. V. Ricci, J. R. Lisa, C. H. Thom, and W. L. Kron. *Amer. J. Surg.*, 74, 387-410, Oct.

1947. 8 figs., 10 refs.

This is a histological study of 22 specimens obtained from foetuses, infants, and adults, each consisting of the fundus, cervix, urethra, vagina, rectum, anal canal, and perineal body removed en masse. Its purpose was to determine whether there are fascial sheets which could be isolated and used as supporting structures in the repair of cystoceles and rectoceles. The vaginal wall was found to be a compact fibro-muscular elastic structure. Its muscle fibres are not separated into two distinct layers of inner circular and outer longitudinal fibres, but consist of circular and longitudinal fibres irregularly distributed. In old age the muscle atrophies and the vagina is mainly a fibro-elastic structure. The anterior vaginal wall and the urethra are fused together. Between vagina and bladder there is a cleavage plane of loose areolar tissue. Posteriorly there is a line of cleavage between vagina and rectum extending from the pouch of Douglas to the apex of the perineal body and formed by non-vascular loose areolar tissue, but the perineal body tightly fuses the vaginal wall to the anus. The authors conclude that there is no evidence to substantiate

belief in the existence of fascia beween urethra and vagina, between bladder and vagina, between perineo-anal canal and vagina, and between vagina and rectum, defining "fascia" as a connective-tissue sheet of variable thickness and possessing tensile strength. Such designations as vesico-vaginal, pubo-cervical, and recto-vaginal fascias are gynaecological misconceptions, and these terms should be struck out of the literature of gynaecological anatomy. F. J. Browne

1020. Histologic Appearance of Coiled Arterioles in the Endometrium of Rhesus Monkey, Baboon, Chimpanzee and Gibbon.

By I. H. Kaiser. Amer. J. Obstet. Gynec., 55, 699, Apr. 1948.

### PHYSIOLOGY.

1021. Early Effect of X-rays on Ovaries of Normal and Adrenalectomized Rats.

By M. Ickowicz. Proc. Soc. exp. Biol., N.Y.,

66, 646-649, Dec. 1947. 3 figs., 5 refs.

In a previous paper the author has demonstrated that irradiation produces pyknotic nuclei of the granular cells of the ovary, including those of the young follicles and those in the resting state. He has also observed that during the first few hours after irradiation ovarian lesions are limited particularly to follicular cells. The object of the present study was to determine the effect of adrenalectomy on pyknosis of the follicular cells of the rat ovary during the first few hours after X-ray irradiation. Highly inbred albino rats were divided into three groups: adrenalectomized rats, irradiated rats, and adrenalectomized and irradiated rats. The first group was killed 24 hours after operation and the others 4 hours after Histology showed that irradiation. adrenalectomy inhibited the production by X-ray irradiation of the pyknotic lesions in the granular Doreen Dalcy layer of the ovarian follicles.

1022. Relationship between Cervical Mucus and Basal Temperature Cycles.

By W. T. Pommerenke and E. Viergiver. Amer. J. Obstet. Gynec., 54, 676-681, Oct. 1947. 17 refs.

Cyclic variations in some of the physical properties of cervical mucus of normal women are well recognized; the object of this study is to correlate these changes with basal temperature variations.

A total of 15 healthy young women with normal menstrual histories and no pelvic abnormality served as subjects in the investigation. Eight of them were known to be fertile. Nearly all were studied through at least 3 cycles, and a total of 80 cycles was observed. The amount of cervical mucus secreted increased markedly for the 3 to 7 days of the mid-cycle and reached its peak in the middle of this phase. The day of maximal production usually occurred from 16 to 12 days before the

onset of the subsequent menstrual period regardless of the length of the cycle. Basal temperatures were recorded in a total of 65 cycles on 14 subjects, and all showed the usual ovulatory diphasic curve. The temperature shift occurred from 16 to 12 days before the subsequent period in 88 per cent of cycles. When the day of maximal mucus secretion was correlated with the time of the basal temperature shift it was found that the two phenomena occurred simultaneously in only 52 per cent of the cycles studied. In 18 per cent of the cycles secretion was maximal 1 to 2 days before the shift, and in 30 per cent 1 to 2 days later. However, in only 2 of 38 temperature charts with well-defined rise did that rise occur outside the period of increased mucus production. The suggestion is made that a study of the cervical mucus cycle, together with the basal temperature chart, may be useful in planning pregnancies. Doreen Daley

1023. The Determination of Reducing Substances in Human Cervical Mucus.

By E. Viergiver and W. T. Pommerenke. Amer. J. Obstet. Gynec., 54, 459-466, Sept. 1947. 21 refs.

Cervical mucus of women menstruating normally is most abundant, most translucent and acellular, and of lowest viscosity, at the time of ovulation. Spermatozoa penetrate the cervical mucus with greatest ease at the time of lowest viscosity, but other properties may be operative in aiding or hindering the migration of spermatozoa through the cervical canal. Because of MacLeod's demonstration that the metabolism of human spermatozoa is largely glycolytic and his suggestion that there may be a suitable substrate in the female genital tract to maintain the motility of the spermatozoa, the authors decided to examine the cervical mucus for glucose, related reducing substances, or their precursors. Young healthy women with normal menstrual histories and normal pelvic findings were the subjects of study. Details are given of the collection of mucus, the estimation of its water content, and the measurement of the reducing sub-Throughout the menstrual cycle the mucus is found to contain free reducing substance, and on hydrolysis additional quantities are found. The various reducing substances are present in lowest concentration in the ovulatory phase. The possible significance of these findings with reference to sperm metabolism is discussed.

Anthony W. Purdie

1024. Examination by Peritoneoscope of the Mechanism of Ovulation. (Der Mechanismus der Eiabnahme im Laparoskop.)

By R. ELERT. Zbl. Gynäk., 69, 38-43, 1947.

2 figs., 15 refs.

The mechanism by which the ovum gains access to the Fallopian tube after being discharged from the ovary is of interest. For a long time it was assumed that the ovum was discharged with the

follicular fluid and aspirated by the fimbrial and tubal ciliary current from the pouch of Douglas into the Fallopian tube. According to this theory neither the ovary nor the muscular activity of the Fallopian tube played any active part. Rouget was the first to show that the suspensory and ovarian ligaments contained smooth muscles fibres and to suggest that they caused a change in the position of the Fallopian tube which helped the reception of the ovum. Von Mikulicz-Radecki, in 1935, described the following changes in the position of the Fallopian tube and ovary which he had observed at the time of follicle ripening. The ampulla is hyperaemic, and the fimbriae arrange themselves in a rosette round the lower pole of the ovary; contractions in the Fallopian tube are marked at this stage and pass from the fimbriated end towards the uterus. The Fallopian tube lies like a curtain over the ovary, and the fimbriae are in a favourable position for the reception of the ovum. Caffier has made similar observations at laparotomy, and has suggested that the follicular fluid and ovum were squirted out from the ovary and caught by the Fallopian tube.

The author has observed I case by peritoneoscopy. The patient, aged 20 years, was thought to have an ectopic pregnancy, but at laparoscopy no evidence of tubal pregnancy was found. The fimbriated end of the left Fallopian tube was not adjacent to the ovary. The right ovary lay deeply in the pouch of Douglas. The right Fallopian tube, whose fimbriated end and ampullary part were hyperaemic, lay on the surface of the ovary. While the author was looking at the Fallopian tube the infundibula and the ampulla disappeared from view and a few seconds later the fimbriae apeared stretched out over the surface of the ovary. The isthmial part of the Fallopian tube could not be observed during this time. The fimbriae, a few seconds later, detached themselves from the ovary and the Fallopian tube now lay along the surface of the ovary as at the time of the first observation. The whole process lasted for 2 minutes. This observation leads the author to believe that the Fallopian tube plays an active part in taking off the ovum from the ruptured follicle. This finding also confirms Westman's observation on rabbits and monkeys. Gladys Dodds

1025. Investigations of Ovulation in Rats. (Ovulationsuntersuchungen an Ratten.)

By F. Besold. Z. Geburtsh. Gynäk., 129, 70-103, 1948. 6 refs.

1026. Characteristics of the Normal Menstrual Cycle. By J. W. GOLDZIEHER, A. E. HENKIN and E. C. HAMBLEN. Amer. J. Obstet. Gynec., 54, 668-675, October 1947. 4 figs., 9 refs.

For many years Fraenkel's statement that "the only regular feature of menstruation is its irregullarity" has been repeated in the literature. Several studies of apparently normal menstrualcycles are unsatisfactory in that proof of ovulation is not provided and the normality of some cases included in the series is open to doubt.

The authors of this paper have studied 109 women examined for sterility. Full investigations were carried out, and no patient with organic or functional ovarian disorders, endocrine disease, or uterine abnormality was included. The patients were aged between 20 and 42 years, most of them being between 25 and 35. A total of 524 cycles was studied and correlated with basal rectal temperature records in every case and endometrial biopsies in some.

Of the 524 recorded cycles, 95.4 per cent were ovulatory, 2.5 per cent anovulatory, and 2.1 per cent indeterminate. The length of the cycle in more than half of the women who were ovulating was between 26 and 29 days, while 92.8 per cent fell within the 23- to 36-day interval. No cycles shorter than 19 days were recorded, and only one was longer than 60 days. The anovulatory cycles ranged from 16 to 38 days and indeterminate ones from 15 to 37 days. The length of the oestrogenic phase was 10 to 16 days in the majority of women, but in nearly one-fifth of the cycles it was longer than 17 days. A short oestrogenic phase is unusual. The progestational phase is more constant in length, and in 94 per cent of cycles it lay between 10 and 16 days. The duration of bleeding was between 3 and 5 days in two-thirds of the cases and, except for one cycle, the limits were between 3 and 9 days. Basal temperature records showed that the difference before and after ovulation was 0.6° to 0.9° F. (0.33° to 0.5° C.) in 78.9 per cent of cycles; in 10 per cent the rise was 1° to 2°F. (0.55° to 1.15° C.) and in 11 per cent the rise was small. The rise was sharp and the curve became level at once in some cases, but in 69.3 per cent the rise continued for 1 to 4 days. In others it occurred more gradually. These studies do not yield new information on the exact correlation of ovulation and temperature rise.

A total of 61 menstrual biopsies was examined. All 58 biopsies in patients with temperature charts suggesting ovulation were found to show progestational change. In 86.3 per cent, histological studies and temperature studies of the length of the progestational phase agreed to within 48 hours. Only two biopsies yielded information significantly different from that obtained from the temperature records. Of the three biopsies taken during cycles judged anovulatory by the temperature chart, two showed late oestrogenic endometrium and the third inexplicably showed full-blown progestational changes despite a flat temperature record.

Doreen Daley

1027. The Factor of Previous Treatment in Experimental Menstruation.

By D. H. PHELPS. J. clin. Endocrinol., 7, 611-623, September 1947. 5 figs., 7 refs.

The present report is based on a series of 107 episodes of uterine bleeding produced in 9 ovariectomized rhesus monkeys. Procedure (Amer. 1. Anat., 1946, 79, 167) included the administration of oestrogens (500 i.u.) with or without progesterone (I to 2 mg.) daily. By correlation of the duration of bleeding with observations made simultaneously on intraocular endometrial transplants (Markee, Contr. Embryol. Carneg. Instn., 1940, 28, 219) it was shown that: " (1) the influence upon the endometrium of a single course of treatment with ovarian hormones may extend through one or more subsequent cycles; (2) permanent changes in the structure of the endometrial vascular bed may result from stimulation by the ovarian hormones: (3) the architecture of the endometrial vascular bed at the beginning of any given course of treatment with ovarian hormones influences the duration of the uterine bleeding produced by that course of treatment." These findings imply that the "preexisting vascular structure " is one of the factors concerned in the control of uterine bleeding. It seems reasonable to suppose that the pre-existing vascular structure—that is, the structure of the endometrial vascular bed at the beginning of the growth phase of the cycle—is not constant in ovarian failure. Clinically this factor may prove useful in evaluating menstrual symptoms and results of hormone therapy.

[These results were obtained on castrated animals, and similar effects were not observed by Goldzieher et al. (Amer. J. Obstet. Gynec., 1947, 54, 636) in the human female.] Magnus Haines

1028. Blood-sugar Levels during the Menstrual Cycle and its Relation to Therapy with Follicular Hormone and Syndromes Associated with Diminution in Oestrogens. (El nivel glucémico durante el ciclo estral y su influenciacion por la terapéutica folicular en los sindromes hipoestrogenicos.)

By J. De Dios Gomez Villalba. Actualidad méd., Granada, 24, 76-79, February, 1948. 21 refs.

1029. The Vegetative Nervous System during the Menstrual Cycle. Its Reactions in Relation to Changes in the Cardiovascular System. (Il sistema nervosa vegetativo durante il ciclo mestruale. Sue reazioni attraverso le modificazioni dell'apparato cardiovascolare.)

By G. CATALDI. Riv. ital. Ginec., 30, 347-363, 1947. 59 refs.

1030. Action of an Intestinal Extract on Uterine Contraction. (Action d'un extrait intestinal sur la contraction uterine.)

By H. Vignes and C. Levasseur. Gynéc. et Obstét., 46, 652-654, 1947. 2 figs.

1031. Does Relaxin Exist? (La relaxine existe-t-elle?)

By R. Courrier and M. Marois. C.R. Soc. Biol., Paris, 141, 1202-1203, Dec. 1947. 6 refs.

1032. Relaxation of the Pelvic Ligaments in Guinea-

pigs by Estrogens and Prostigmine.

By F. E. EMERY and A. H. LAWTON. Amer. J. Physiol., 151, 134-137, Nov. 1947. 4 figs., 12 refs.

By A. E. W. SMITH and P. C. WILLIAMS. J. Endocrinol., 5, 152-157, July 1947. 4 refs.

The authors have previously reported the loss of oestrogen potency of dienoestrol and stilboestrol, while the chemical instability of similar solutions was demonstrated independently by Warren and Gulden. The present paper describes the examination of some of the conditions affecting the stability of these and other oestrogens in solution. Solutions were prepared by dissolving 10 mg. of the oestrogen in 100 ml, of absolute alcohol or acetone. Aliquot portions of these solutions were diluted with the solvent to be investigated to give 1  $\mu$ g, per ml., and dilutions of these stock solutions were made at intervals for biological testing. A trace of toluene was added to the aqueous and urinary solutions to prevent bacterial or mould contamination. All except the urinary solutions were kept at room temperature.

Spayed rats were injected with o.r ml. of solution twice daily for 3 days and vaginal smears were taken twice daily for the two following days. Smears consisting entirely of cornified and/or epithelial cells were regarded as positive and the results expressed on a percentage basis.

It was found that dienoestrol and stilboestrol lose oestrogenic potency when kept in aqueous solution or in solution in alcohol or acetone. Oestrone, hexoestrol, and oestradiol are relatively stable under the same conditions. The instability of dienoestrol and stilboestrol is greater when the solutions are aerated or in the presence of benzoyl peroxide or hydrogen peroxide. The loss of activity may be partially inhibited in the presence of hydroquinone. All five oestrogens are relatively stable in dilute solution in sesame oil and in normal men's urine kept at low temperature. Doreen Daley

1034. The Relation between Direct and Indirect Oestrogenic Function in a Series of Synthetic Oestrogens.

By G. Brownlee and A. F. Green. *J. Endocrinol.*, **5**, 158-165, July 1947. 3 figs., 15 refs.

Administration of oestrogens to experimental animals is followed by a number of effects, which vary with the dose. The proliferatory changes in the vagina, uterus, and nipples are direct effects, while changes in mammary development and lactation, which are mediated through the anterior pituitary gland, may be regarded as indirect. Diethylstilboestrol has been shown to differ functionally from the naturally occurring oestrogens only in a few minor respects. The object of the present investigation is to determine whether modification of the diethylstilboestrol structure results in compounds with different ratios of direct

to indirect oestrogenic activity. Six of the compounds have been compared for their effect in increasing uterine weight in immature spayed rats and inhibiting lactation in the parturient rat. Administration of these compounds was found also to cause loss of granules from almost all cells in the pars glandularis of the anterior pituitary, with increase in number of the reserve cells and a decrease in the proportion of eosinophil cells. The uterus showed gross hypertrophy with convolutions of the epithelium and vacuolation of the mucosa. In the mammae there was loss of active secretory tissue and in the adrenals congestion and vacuolation of the cortex with similar changes in the medulla in extreme cases.

In the present series of compounds the relative physiological efficiency is the same whether tested on the uterus or by suppression of lactation, and similarity of effect on anterior pituitary, adrenals, and ovaries has also been demonstrated. effects on lactation are greatly increased when the mother has undergone ovariectomy. The slope of log-dose/uterine-weight curves for different oestrogens given by the same route varies, and provides evidence of varying rates of absorption and elimination. There is also considerable difference in comparative activities by different routes. . One compound  $(4.4' - dihydroxy - a, \beta, -2, 2' - tetra$ methylstilbene) with similar activity after subcutaneous injection in oil is five or six times as active as diethylstilboestrol by mouth and three times as active when incorporated in the diet of Doreen Daley

1035. A Comparison of the Growth of the Ovum and Follicle in Normal Rhesus Monkeys, and in Monkeys Treated with Oestrogens and Androgens.

By S. H. Green and S. Zuckerman. J. Endocrinol., 5, 207-219, Nov. 1947. 7 figs., 25 refs.

The ovaries of 13 rhesus monkeys, 2 of which had been treated with oestrone and 3 with testosterone propionate, were serially sectioned and the size of the oöcyte, nucleus, and follicle was measured. The percentage of follicles with different numbers of layers of granulosa cells was also determined. Regression equations were calculated for the relation of the size of the ovum to the size of the follicle and considered separately for the two phases of growth—that in which both ovum and follicle grow and that in which no further growth of the ovum takes place and the follicle alone increases in size. In neither phase was a statistically significant difference found for the relative growth of ovum and follicle between the normal and the treated animals. Androgen stimulated considerably the development of the early stages of follicular growth, but did not affect the later stages. Oestrogen prevented the later stages of follicular development and caused widespread atresia in the earlier stages. Both androgens and oestrogens seem to have a direct influence on the ovaries. H. Herxheimer

1036. Fate of Some Oestrogenic Phenanthrene and Stilbene Derivatives in the Rat.

By A. T. Nielsen, K. Pedersen-Bjergaard and M. Tonnesen. J. Endocrinol., 5, 111-114, July 1947. 12 refs.

This work was planned to determine whether natural oestrogens are less active when given by mouth than when administered parenterally and whether synthetic oestrogens have much the same activity by either route. Other workers had concluded that oestrone, unlike stilboestrol, is not inactivated by the liver.

All assays were carried out on adult spayed rats, which had been subject to previous priming with an oestrone injection. Test substances were given in aqueous solution or suspension, and results were assessed on the dosage necessary to produce complete vaginal cornification in 50 per cent of the Oral, subcutaneous, and intravenous (portal and femoral) routes were investigated and the effect of the various oestrogens was also studied in a group of rats whose liver function had been depressed by carbon tetrachloride. results showed that the six oestrogens compared could be divided into three groups: (1) Those oestrogens which are not inactivated by the liver whether they are given orally or parenterallystilboestrol and dienoestrol. (2) Those oestrogens which are inactivated by the liver when given orally—oestrone, oestradiol, and hexoestrol. (3) Those oestrogens which are inactivated by the liver whether given orally or parenterally—oestriol.

· Doreen Daley

1037. Interrelation between Vitamin C and Follicular Hormone. [In Russian.]

By M. D. SHEINERMAN and V. G. GERSTEIN. Ahush. Ginec., No. 4, 23-27, 1947.

Two series of experiments were conducted to determine the relation between vitamin C and folliculin. In the first series, 48 adult castrated white mice were divided into 4 groups of 12 animals; the first group received 6 mg. of vitamin C daily for 3 days; the second group the same dosage of vitamin C followed by 0.5 mouse unit of folliculin; the third group 0.5 mouse unit of folliculin followed by the same dosage of vitamin C; and the fourth group received 0.25 mouse unit of folliculin with the same dosage of vitamin C as the other animals (18 mg.). The presence or absence of oestrus was determined by vaginal smears. No oestrus occurred in the first and fourth groups; oestrus occurred on the fourth day in the second and third groups. In the second series 24 infantile rats were divided into 4 groups of 6 animals; the first group received 60 mg. of vitamin C in 2 days; the second group received 25  $\mu$ g. of crystalline folliculin; the third group received 25  $\mu$ g. of crystalline folliculin and 60 mg. of vitamin C; and the fourth group served as controls. At the end of the experiment the rats were killed and the weight of each uterus was determined. The average weight

of the uterus in animals of the first group was 0.051 g.; the smallest uterus in either of these groups weighed 0.038 g. and the largest 0.066 g. The average weight of the uterus in animals of the second group was 0.093 g.; the smallest uterus weighed 0.016 g. and the largest 0.121 g. The average weight of the uterus in animals of the third group was 0.262 g.; the smallest uterus weighed 0.120 g. and the largest 0.305 g. It is concluded as the result of these experiments that ascorbic acid potentiates the action of oestrogens.

Nicolas Tereshchenko

1038. The Formation Mechanism of Oestrogenic Hormones. II. The Presence of the Oestrogen-Precursor in the Ovaries of Rats and Guinea-pigs. [In English.]

By L. CLAESSON and N. A. HILLARP. Acta physiol. scand., 14, 102-119, Sept. 30, 1947. 8 figs., 36 refs.

This series of experiments at the Histological Institute, Lund, is designed to study a sterol oestrogen-precursor in the ovaries of rats and guinea-pigs in oestrus. Ovaries were removed from albino rats and guinea-pigs at different phases of the cycle, during pregnancy, and after coitus (rats only). Ovaries were also studied after injections of the gonadotrophins. Frozen sections (10  $\mu$ ), fixed in formalin for at least 10 days, were examined according to the methods applied by the authors to rabbit ovaries (Acta physiol. scand., 1947, 13, 115). Determinations by polarized light and by the Schultz reaction vielded identical results in rabbits, but occasionally divergent results were obtained in rats and guinea-pigs. The authors claim that the precursor; which they consider to be similar to, if not identical with, cholesterol, is formed mostly in the interstitial part of the ovary in rabbits, rats, and guinea-pigs, and to some extent in the theca Magnus Haines interna of rabbits and rats.

1039. The Endometrium in Old Age. (Endometrio senile.)

By L. GIANAROLI. Riv. ital. Ginec., 30, 61-113,

1947. 14 figs., 44 refs.

An extensive study of the modifications of the endometrium in old age is useful to distinguish the normal process of involution from the pathological. The author has examined the endometrium in 50 women from the menopause to advanced old age. Detailed tables are given. Three fundamental types of change have been observed in the mucosa of the uterine body and are as follows: (1) Simple and generalized atrophy. In this, the reduction in volume of the various tissue elements is uniform; it has the same characters as the simple atrophy found in other organs in old age, and is due to the same biological factors. (2) Cystic atrophy. This is described as the appearance of small cystic cavities which are sometimes spread all over the mucosa and sometimes (15 per cent) are crowded into one part of the mucosa, especially near the

fundus of the uterus, forming polypoid growths. These cystic changes suggest a slow secretory activity of the epithelium, probably of ovarian origin. The formation of the simple cystic polyp of old age is related to the intensity of the secretory stimulus. (3) Modifications of circulatory character. A dilatation of the capillaries of part of the mucosa sometimes extends to those of the myometrium. Such alterations are possibly of mechanical origin (arteriosclerotic lesions). The frequent occurrence of telangiectasia in this series (26 per cent) has led the author to believe that the determining factor is vascular, active enlargement of the capillaries taking place possibly under the influence of an ovarian stimulus. Haemorrhages often found in the endometrium and the myometrium (20 per cent of all cases) are of secondary importance. The phenomena described often vary in their intensity, and more than one type of lesion may be present in the same uterus. The cysts, the simple cystic polyp, and the telangiectases are the consequence of temporary irregular reactivation of ovarian function. The appearances in the endometrium and ovaries examined suggest to the author that functional activity of the ovary may Rina Saunders still be present in old age.

1040. A New Colorimetric Method for the Determination of Pregnandiol.

By J. W. GOLDZIEHER. J. Lab. clin. Med., 33, 251-253, Feb. 1948. 2 figs., 7 refs.

1041. The Quantitative Determination of Small Amounts of Pregnandiol in Human Urine.

By I. F. Sommerville, N. Gough, and G. F. Marrian. J. Endocrinol., 5, 247-257, Jan. 1948. 16 refs.

1042. A Simplified Technique for the Quantitative Colorimetric Estimation of Pregnandiol in Urine.

By H. S. GUTERMAN and M. S. SCHRODER. *J. Lab. clin. Med.*, 33, 356-366, Mar. 1948. 4 figs., 14 refs.

1043. Effects of Prostigmine on the Genital System of the Rat. (Effetti della Prostigmina sulla sfera genitale della ratta.)

By A. MARTELLA. Riv. ital. Ginec., 31, 205-212, 1948. 4 figs.

1044. Production of Antihormones as a Result of Treatment with Mares' Serum Gonadotrophin. (Antihormone-Dannelse ved Behandling med Hoppeserum-Gonadotropin.)

By C. Hamburger. Ugeskr. Lag., 110, 434, Apr. 8, 1948. 2 refs.

1045. Studies on Urinary Secretion of Gonadotrophins. (Nuove ricerche sulla gonodotropinuria nei tumori ovarici.)

By P. Paracchi and E. Gallico. *Tumori*, 21, 264-273, 1947. 5 figs., 33 refs.

10.46. Studies on the Bioassay of Hormones. The Assay of Estrogens by a Chick Oviduct Method.

By R. I. DORFMAN. Endocrinology, 42, 85-92, Feb. 1948. 3 refs.

1047. Studies on the Bioassay of Hormones. The Assay of Pregnant Mare's Serum Chorionic Gonadotrophin.

By R. I. DORFMAN. Endocrinology, 42, 93-97, Feb. 1948. 3 refs.

1048. Studies on the Bioassay of Hormones. The Comparative Oviduct Response of Various Breeds of Chicks to Stilbestrol.

By R. I. DORFMAN. *Endocrinology*, **42**, 102-106, Feb. 1948. 6 refs.

1049. Distribution of Estradiol between Serum and Red Cells.

By F. Bischoff and R. E. Katherman. *Amer. J. Physiol.*, 152, 189-196, Jan. 1948. 3 refs.

1050. Relation of the Pineal to the Female Sex Organs. (Rapporti fra pineale ed organi genitali femminili.)

By N. Passalacqua. Mon. ostet.-ginec., 18, 149-168, July-Dec. 1947. 7 figs., Bibliography.

### PREGNANCY.

1051. Radiographic Morphology of the Renal Pelvis and Ureter in Pregnancy. (Morfologia radiografica del tratto pelvi-ureterico in gravidanza.)

By I. CESA and V. MASINI. Radiologia, Roma,

8, 623-633, 1947. 10 figs., 70 refs.

This paper from the Institutes of Obstetrics and Gynaecology and of Medical Radiology, University of Rome, is based on 50 intravenous pyelographies carried out on women between the fourth and ninth months of a normal uncomplicated pregnancy. The authors consider the alterations observed in the urinary tract in all the cases examined as physiological. These changes became manifest at about the fourth or fifth month of pregnancy and became more accentuated as the pregnancy advanced. The changes observed were dilatation of the renal pelvis and calices, and dilatation, deformity, elongation, and kinking of the ureters. There is a discussion of the mechanical and dynamic theories of the changes in the urinary tract in pregnancy, and an eclectic theory, admitting both mechanical and dynamic causes, is advanced. A. Orlev

1052. Chinese Maternal and Fetal Measurements. By D. D. Kulcsar. Chinese med. J., 65, 397-428, Nov.-Dec. 1947. 7 figs., 28 refs.

1053. The Elderly Primipara. (Primiparidad añosa.)
By D. CARRIL SOLARI. Bol. Soc. chil. Obstet.
Ginec., 12, 141-151, Aug. 1947. 4 refs.

1054. Duration of Pregnancy in Filipino Women. (A Preliminary Report.)

By C. B. Tejada. J. Philippine med. Ass., 34, 83-88, Feb. 1948.

1055. Emotional Factors in Obstetrical Practice.

By P. A. REYNOLDS. California Med., 68, 151-153, Mar. 1948.

1056. Studies in Rh-isoimmunization in Pregnancy. Observations in a Series of Ninety-six Sensitized Women.

By M. S. SACKS, W. J. KUHNS, and E. F. JAHN. Amer. J. Obstet. Gynec., 54, 400-414, Sept. 1947.

This paper presents a summary of findings in the University of Maryland School of Medicine, Baltimore, during 13 months' work from August 1, 1945, to August 31, 1946. In this period a total of 12,275 patients was studied. Of these, 12,140 were an unselected group and 135 were specially referred to the laboratory as known

Rh-negative subjects.

In the unselected group the division between Rh-positive and Rh-negative groups (as tested by potent anti-Rh O serum) conformed to general experience, being respectively in white patients 84.4 per cent: 15.6 per cent, and in negroes 92.7 per cent: 7.3 per cent. Out of the total 12,275 patients there were 96 deliveries in patients who exhibited various Rh antibodies. Of these, 86 were classified as Rh-negative, and 10 as Rhpositive. These represent respectively 4.84 and 0.005 per cent of the total Rh-positive and Rhnegative populations. It is pointed out that 9 of the 10 Rh-positive patients belonged to the debatable Rh' and Rh" groups, and that only 1 patient exhibited Hr immunization (being of group Rh<sub>1</sub>). Of the Rh-negative women with Rh-positive husbands the percentage showing immunization was 5.26 per cent. Nine were primigravidae and 77 were multiparae, these figures representing respectively 1.24 and 8.48 per cent of the population at risk. The general incidence of erythroblastosis foetalis was I in 215 (0.46 per cent). In a total of 79 immunized patients delivered at the time of the study the incidence of erythroblastosis was only 67.1 per cent.

It was possible to determine the specificity of the anti-bodies in 38 of the immunized patients. The figures were respectively:

Pure anti-Rh' and anti-Rh" were not encountered. The type of antibody in the total of 96 immunized patients was univalent (incomplete, blocking) in 65 (67.7 per cent), bivalent in 23 (24.1 per cent), and univalent and bivalent in 8 (8.3 per cent). No instances of erythroblastosis due to A-B-O incompatibility were observed.

Low titre anti-O antibody was observed occasionally, without evidence of damage to the infant.

The quantitative study of the antibodies was carried out in a wide variety of diluents, including serum, plasma, and bovine albumin solution, the sensitivity of the test appearing to increase from serum through plasma to albumin. It is therefore necessary to specify the diluent in comparing the results in differing titrations, and an agreed standard technique is desirable.

The authors observed the first appearance of antibodies during pregnancy in 16 cases. In 11 of these this transition was delayed until the last trimester. They noted that in the production of erythroblastosis the duration of immunization appeared less important than the actual titre reached by the antibodies. In a group of 19 patients in whom it was possible to compare antenatal and postnatal levels of antibodies, a significant rise in titre was noted after delivery, and in some cases the increase was very large, much larger than that observed in any case during pregnancy. It is deduced that labour is a potent factor in the stimulation of antibody formation, possibly through the release into the maternal circulation of large numbers of foetal erythrocytes, due to " placental rupture". Persistence of the antibodies was observed for periods of 1 to 60 months after immunization. This was judged in some cases as dating from the birth of a previous child affected with erythroblastosis.

The influence of parity on immunization was also studied. Six out of 10 immunized primigravidae gave a history of previous transfusion; in the remainder the authors do not discount the possibility of a forgotten intramuscular injection of whole blood in childhood. The immunization was detected in the second pregnancy in 41 out of 86 parous patients; in the remaining 45 the event was scattered between third and eleventh pregnancies.

[The assumption that the sharp increase in antibody titre after labour may be due to placental flooding of the maternal circulation appears rather unsatisfactory, and it might be put forward as an alternative speculation that the withdrawal of the foetus and placenta might allow an increase in circulating antibodies, which had previously been fixed by the foetal antigens. The most menacing fact which emerges is the frequency with which immunization occurred at the time of the second pregnancy. The need to strive for a living baby in the first pregnancy of an Rh-negative woman married to an Rh-positive man becomes of peculiar importance, even allowing for the fact that the quoted incidence of immunization is only 5.26 per cent. The authors' plea for standardized technique in antibody titration is obviously justified, and a plea for standardization of Rh nomenclature is equally worthy of support.

W. I. C. Morris

1057. Antenatal Blood Group Determination. A

Preliminary Report.

By S. H. POLAYES, S. LUBIN, and J. McNally. Amer. J. Obstet. Gynec., 55, 524-526, Mar. 1948. 2 refs.

1058. Biological Reactions of Pregnancy at the End of Pregnancy and in the Puerperium. (Die biologische Schwangerschaftsreaktion am Ende der Gravidität und im Wochenbett.)

By C. A. Joel. Gynaecologia, Basel, 125,

151-162, Mar. 1948. 4 figs., 9 refs.

1059. Studies in Carbohydrate Metabolism in Pregnancy. (Ricerche sul ricambio glucidico in gravidanza.)

By V. GIRARDI. Ginecologia, Tormo, 14, 1-19, Jan. 1948. 9 figs., 59 refs.

1060. Composition and Structure of the Liver Cell in Pregnancy.

By H. W. Kosterlitz and R. M. Campbell. *Nature*, *Lond.*, **150**, 676-677, Nov. 15, 1947.

refs.

The desoxyribose nucleic-acid content of the liver of pregnant rats was shown to be significantly increased by the third week of gestation and was greater than could be accounted for by the increase in maternal body weight. The total amount was related to the sum of maternal and foetal body weights and was independent of the diet. A specific rise of 40 to 45 per cent in the ratio of ribose nucleic to desoxyribose nucleic acids also occurred; this was not due to dietary changes during pregnancy and was correlated with foetal body weight. The increased ribose nucleic-acid content was particularly apparent in the periportal area. Glycogen content of the liver was much decreased. J. Dawson

1061. Renal Function Tests in Pregnancy. (A propos de l'exploration fonctionnelle des reins au cours de la grossesse.)

By M. MAYER and J. THOYER-ROZAT. Gynéc. et Obstét., 46, 683-686, 1947.

1062. The Thrombokinase Content of the Placenta. (Uber den Thrombokinasegehalt der Placenta.)

By W. Neuweller and —. Schwab. Gynaecologia, Basel, 125, 163-169, Mar. 1948. 1 fig.

1063. Oxygen Uptake of Human Placental Tissue as Affected by Selected Substrates and Drugs.

By H. P. JAMES, H. W. ELLIOTT, and E. W. PAGE. *Proc. Soc. exp. Biol.*, *N.Y.*, **67**, 130-132, Feb. 1948. 12 refs.

1064. On a Normal Human Embryo of Seventeen Days' Development.

By G. G. ROBERTSON, S. L. O'NEILL, and R. H. CHAPPELL. *Anat. Rec.*, 100, 9-21, Jan. 1948. 19 refs.

1065. Critical Study of the Method of Dorn and Sugarman for the Diagnosis of Foetal Sex During Pregnancy. (Etude critique de la méthode de Dorn et Sugarman pour le diagnostic du sexe de l'enfant pendant la grossesse.)

By D. TROLLE. Rev. franç. Gynéc., 42, 345-

353, Dec. 1947. 15 refs.

1066. Study of Progesterone Formation in the Foetal Adrenal. (Untersuchungen über die Progesteronbildung in der fötalen Nebenniere.)

By F. Hoffmann. Zbl. Gynäk., 69, 43-48, 1947.

1 fig., 13 refs.

It has not yet been demonstrated that the foetus takes part in the production of hormones with an effect on pregnancy. This study is interesting because it shows that progesterone is formed in small quantities in the last three

months of pregnancy by the foetus.

The suprarenal gland is a relatively large organ in the newborn infant; it weighs 6 to 8 g., while the approximate weight in the adult is 12 g. This, together with the fact that the gland involutes rapidly after birth, suggests that its hormone may play some part in the endocrine control of pregnancy. The author describes his own method for extraction and identification of small quantities of the hormone. The suprarenal cortex contains I corner unit (I mg.) of corpus luteum hormone in 100 to 180 g.; the ovarian cortex contains the same amount in 100 g. The foetal suprarenal in the last three months of pregnancy contains about 4 to 4.5 units of corpus luteum hormone, but none in earlier months. Thus, progesterone is formed in the foetus at the stage in pregnancy when there is decreased formation by the placenta and corpus luteum.

Quantitative estimations of progesterone during the second half of the menstrual cycle and during pregnancy were also carried out. The progesterone content on the 14th day of the menstrual cycle was just over 2 units; it rose to 6 units from the 18th to the 24th day and thereafter fell rapidly, practically to zero by the 34th day. During pregnancy the progesterone content at the 2nd month was 6 units, at the 4th month 10 units, at the 6th month 6 units, at the 7th month 5 units; it then diminished rapidly, so that during the 9th and 10th months there was very little progesterone

erone.

It is suggested that the foetal suprarenal plays an active part in diminishing the production of progesterone from the corpus luteum of pregnancy and from the placenta. Gladys Dodds

1067. A Diagnostic Reaction in Pregnancy and the Action of Gonadotrophins on the Male Toad. (Reacción diagnóstica de embarazo y acción de la gonadotrofinas en el sapo macho.)

By C. Galli Mainini. Bol. Soc. méd. Mendoza,

No. 33, 97-108, Sept. 1947. 21 refs.

Details are given of the experimental work on

which is based the pregnancy test known in South America by the author's name. Since 1923 Houssay and his colleagues in Buenos Aires have published a series of articles showing the relation between the hypophysis and testicle of the male toad Bufo arenarum Hensel. After subcutaneous injection into this animal of 10 ml. of urine from cases of pregnancy, spermatozoa appear in the bladder urine, which may be obtained for examination by the insertion of a pipette into the Altogether 1,937 toads have been used. Those weighing 100 g. or more are preferred for the tests, as negative results are found in those of 60 to 70 g. The same animal should not be used more than four times. The duration of captivity does not affect the result unless it is prolonged. If the animal is kept at a temperature of about 24° C. it is more sensitive, and also when kept in the dark.

The minimum dose of chorionic gonadotrophin necessary to obtain a response is about 40 international units. Enormous doses cause spermatozoa to appear in the ureter in 10 minutes and in the bladder in 20 minutes. Removal of the liver increases the sensitivity of the animal. Intracardiac injection is more effective than intramuscular, subcutaneous, or intraperitoneal, and intragastric injection is ineffective. Traumatism of the testicle, renal and testicular congestion, and ligation of the ureter may give positive results. The sensitivity of reaction was not varied by dividing the dose, by unilateral castration, by destruction of the medulla, or by anaesthesia. Positive results were obtained by the implantation of the hypophysis of the rat and the rabbit, and by injection of bovine follicle-stimulating hormone but not of follicle-stimulating hormone from the urine of normal and menopausal women. Consistently negative results were obtained with oestrogens, progesterone, thyroxine, adrenaline, desoxycorticosterone, "pitressin", zinc sulphate, methylene blue, and extracts from the urine of normal and menopausal women.

The test was carried out in 485 cases of pregnancy, and in 90 per cent of the positive cases the result was available within 2 hours, the quickest result being obtained within 40 minutes. In 169 of 177 cases the result was identical with that of the Friedman test. In the remaining cases in which the diagnosis was known, the result proved the toad test to be the correct one. In 180 non-pregnant patients the test was consistently negative. The mortality among the toads used was 0.9 per cent, as opposed to that of 4.3 per cent for the rabbits used for the Friedman test. The results were positive in cases of amenorrhoea of 4, 5, 12, 16, and 17 days' duration. Between the sixth and ninth month of pregnancy positive results were obtained with the urine in 92 per cent of cases, and with the serum in 69 per cent of cases. No relation was found between the amount of

serum injected and the result. The test permits a quantitative estimation of the amount of chorionic gonadotrophin in the urine in pregnancy.

The author believes that this test has the advantages of being simple, rapid, specific, and easy to read owing to the absence of the personal factor.

Bryan Williams

1068. Ovulation in the South American Toad Bufo arcnarum after Chorionic Gonadotrophin. (Ovulación del "Bufo arenarum" con gonadotrofina coriónica.) By C. GALLI MAININI. Rev. Soc. argent. Biol..

23, 299-302, Dec. 1947. 4 refs.

1069. The Most Practical Biological Test for Pregnancy. (De meest practische biologische zwangerschapstest.)

By G. Vandenberghe. Belg. Tijdschr. Geneesk.,

4, 360-364, Apr. 15, 1948. 6 figs.

1070. Melanophore Diagnosis of Pregnancy. (Le mélanophorodiagnostic de la grossesse.)

By L. SERVANTIE and G. F. MORETTI. Sem. Hôp. Paris, 24, 642-645, Mar. 14, 1948. 30 refs.

1071. Early Diagnosis of Pregnancy by the Galli-Mainini Reaction in Some Brazilian Amphibia. (Diagnostico precoce da gravidez pela reacao de Mainini em alguns anfibios Brasileiros.)

By M. I. Mello. Hospital, Rio de J., 33, 57-

64, Jan. 1948. 4 figs., 20 refs.

1072. Some Features of Radiological Diagnosis in Obstetries. (Algunos aspectos del diagnóstico radiológico obstétrico.)

By V. FONT SASTRE. Med. esp., 19, 58-63, Jan.

1948. 4 figs.

1073. Toxaemia of Pregnancy. (Toxemia da gravidez.)

By S. T. GARBER and N. S. ASSALI. An. brasil. Ginec., 25, 87-100, Feb. 1948. 12 refs.

1074. Clinical and Aetiological Features of Hypertension and Albuminuria during Pregnancy. (Note sur certains aspects cliniques et étiologiques de l'hypertension et de l'albuminurie observés au cours de la gestation.)

By J. Bret. Rev. franç. Gynéc., 43, 57-71,

Feb. 1948.

1075. Functional Pathology of Toxaemias of Pregnancy. (Pathologia funcional de las toxemias gravidicas.)

By A. Novo González. *Med. esp.*, 19, 7-22, Jan. 1948.

1076. Serum Glucuronidase Activity During Normal and Toxaemic Pregnancy.

By D. F. McDonald and L. D. Odell. J. clin. Endocrinol., 7, 535-542, Aug. 1947. 3 figs., 26 refs.

The glucuronidase level in serum was determined in 54 non-pregnant and 100 pregnant women, and 24 patients with toxaemia of preg-

nancy. It gradually increases during pregnancy from 5.3 µg. per ml. to nearly 14 µg. Twelve patients with hypertensive toxaemia had similar values, whereas those with pre-eclamptic or eclamptic toxaemia had increased glucuronidase levels, ranging from about 20 to 50  $\mu$ g. The reason for the increase during pregnancy is still unknown. H. Herxheimer

1077. Lack of Nuclear Segmentation of Neutrophil Granulocytes in Toxaemias of Pregnancy. (Sull' insegmentazione del nucleo dei granulociti neutrofili nelle tossicosi gravidiche.)

By U. Bracale. Arch. Ostet. Ginec., 56, 31-44, Jan.-Feb. 1948. 21 refs.

1078. Haematology of Pregnancy: The Bone Marrow in the Toxaemias. (Estudios sobre hematología de la gestación: La medula osea en las gestosis.)

By M. Montoya Gómez. Clin. y Lab., 45, 172-179, Mar. 1948. 7 figs., 4 refs.

1079. Concentrated Plasma in the Treatment of the Severe Late Toxaemias of Pregnancy.

By A. Golden and G. Fraser. Amer. J. Obstet. Gynec., 54, 523-528, Sept. 1947. 27 refs.

Twice-concentrated plasma is advocated for toxaemic anuria with or without eclampsia. It is claimed that its colloidal osmotic action reduces oedema, relieves haemoconcentration, increases the diminished circulating blood volume, and increases urinary output. The only serious danger of this treatment is that of circulatory overloading. In the 5 cases reported this was avoided by giving only 300 ml. at a time. The plasma is used only as an addition to routine treatment, as, for example, when administration of hypertonic glucose appears to be failing. The 5 cases reported were all severe and responded promptly to the plasma. Aileen Dickins

1080. Further Observations on the Use of the Neutral Diet and Hydration in the Treatment of Toxaemias of Late Pregnancy.

By R. R. DE ALVAREZ. Amer. J. Obstet.

Gynec., 54, 445-458, Sept. 1947. 12 refs.

This paper is an evaluation of a standardized form of treatment of cases of toxaemia of late pregnancy by a neutral diet, administration of ammonium chloride, abundant fluids, rest in bed

in hospital, and sedation.

The neutral diet consists of foods which yield an equal amount of acid ash and alkaline ash, to which are added certain foods that yield an ash with no chemical reaction. These foods are prepared and served without the addition of salt and are selected because of their low sodium content. Neutral diet implies a diet which is salt-free and poor in sodium. Foods yielding different kinds of ash are listed. Sufficient water is required to carry off such products of metabolism as the kidneys ordinarily excrete. Fluids are supplied by mouth, parenterally, or by both routes, to ensure a mini-

mum daily urinary output of 2 litres. A daily minimum intake of 4 litres may be necessary for this. Emphasizing that inundation with fluid is impractical and unnecessary, the author claims that forcing fluids in toxaemic patients increases oedema only when sodium bicarbonate or uncontrolled sodium-chloride ingestion is permitted; he records controlled experiments in support of this. Ammonium chloride is administered to release the sodium ion from the tissues and the intercellular fluid retained by the sodium. An average dose is 3 g. (in gelatine capsules of 0.5 g.) three times daily for 4 days. It is broken down in the gastrointestinal tract and absorbed as ammonium and chloride ions. In the liver the ammonium ion combines with carbon dioxide and water to form ammonium carbonate, which is converted into urea and excreted as such in the urine. The kidney tends to reconvert urea to ammonium ion after prolonged ammonium-chloride administration, which is therefore restricted to 4 days; after 3 days' rest it is resumed. Ammonium chloride restores the extracellular fluid content to normal and hydrates the blood vascular system, thus freeing additional water for urinary excretion of solids.

The classification of the patients studied and the response to treatment are shown in the following table:

Type of Toxacmia		No Treatment	Improved	No Change	Progressive	Maternal Mortality
Unclassified Benign hypertensive Malignant hypertensive Chronic vascular nephritis Acute glomerulonephritis Chronic glomerulonephritis Mild pre-eclampsia Severe pre-eclampsia Eclampsia		1 2 - 2 3 1	9 12 1 1 7 80 44 14	6 3 3 	3 1 3 2	0 0 3 0 0 0 0
Total Percentages	::	9	169 75	37 16.5	9	6 2.67

When conservative methods fail to control pregnancy toxaemia, termination of the pregnancy by the most conservative means suited to the particular individual is indicated.

Anthony W. Purdie

1081. Treatment of Hyperemesis Gravidarum with Hormone and Vitamin.

By J. Hidalgo. J. Philippine med. Ass., 34, 93-94, Feb. 1948.

1082. Treatment of Placenta Praevia. A Review of Cases Treated in the Glasgow Royal Maternity Hospital, 1941-1946. A-The Maternal Aspect.

By H. STIRLING. Edinb. med. J., 54, 504-509, Sept. 1947.

In this review placenta praevia is classified as

" mild ", corresponding to the better known "lateral" type, and "severe", which includes all other types. The diagnosis was made by digital examination without anaesthesia, except in a very few cases. During the 5-year period 505 cases of placenta praevia were treated, 222 being mild and 283 severe; 88 cases occurred in primigravidae (17 per cent), in whom the mild type was more common (63 per cent) than the severe. In multigravidae cases were more frequently severe (60 per cent). Postpartum haemorrhage developed in 32 cases and caused 3 deaths. Manual removal of the placenta was carried out on 8 occasions. Postpartum haemorrhage occurred more often in mild cases (10.8 per cent) than in severe cases (2.8 per cent) owing to the high incidence of Caesarean section in the latter group. Blood transfusion was given in 109 cases, I death resulting from incompatible transfusion. There were 18 maternal deaths (3.6 per cent), 4 in the mild group (1.8 per cent) and 14 in the severe group (5 per cent). Causes of death were: haemorrhage and shock, 8 cases; sepsis, 3 cases; respiratory infection, 2 cases; death under anaesthesia, 3 cases; acute cardiac failure in 1 case and an incompatible blood transfusion in another before delivery. Complications in the puerperium occurred in 69 cases, a morbidity rate of 13.7 per cent, 20 in the mild group (9 per cent) and 49 in the severe group (17.3 per cent). There were 8 cases of puerperal sepsis.

In the whole series 279 Caesarean sections were performed, of which 7 were classical. Spinal analgesia was employed in 82 cases with 1 anaesthetic death, and general anaesthesia in 170 cases with I anaesthetic death. A third anaesthetic death occurred after combined spinal and general anaesthesia, but was thought to be due to chloroform. Fatal complications were more frequent after general anaesthesia than after spinal anal-In 124 cases there was no treatment; rupture of the membranes was carried out in 65 cases, version in 32 cases, packing in 5 cases. Willett's forceps were not employed in any of the cases. In the mild group there was no treatment in 120 cases; rupture of the membranes was performed in 65 cases, Caesarean section in 27, version in 7, and packing in 3 cases. Choice of treatment did not appear to influence maternal mortality. In the severe group there were 252 Caesarean sections and 25 versions; 2 cases were treated by packing, and 4 received no treatment. Maternal mortality was lowest in the Caesarean section group (3.6 per cent), and highest in the small "no treatment " group (50 per cent in 4 cases). Treatment was delayed in 138 cases (27 per cent), vaginal examination not being made within 24 hours of admission. [From the subsequent paper, pregnancy continued for at least 7 more days in 62 (45 per cent) of these cases.] Of these cases 71 were mild, and 67 severe. Delay in treatment resulted in a slight increase in maternal mortality

in both mild and severe cases; in a slight reduction in morbidity in mild cases; and in an increase in morbidity in severe cases. It was concluded that delay in treatment resulted in a slight but definite added risk to the mother.

Ian T. Fraser

1083. Treatment of Placenta Praevia. A Review of Cases Treated in the Glasgow Royal Maternity Hospital, 1941-1946. B—The Foetal Aspect.

By R. A. TENNENT. Edinb. med. J., 54, 510-

521, Sept. 1947.

In the cases of placenta praevia described by Stirling (Abstract 1082) 507 infants were born. Foetal mortality rate was 34.1 per cent, stillbirth rate 15.2 per cent, and neonatal death rate 18.9 per cent. Foetal mortality rate was 25.5 per cent in the mild group and 40.8 per cent in the severe group, due to the greatly increased neonatal death rate in the latter. The incidence of foetal abnorhydrocephalus, malities—anencephaly, exomphalos, and mongolism—was r.35 per cent. Foetal mortality was related to birth weight, being very high in the groups of lowest weight, and still as high as 41.4 per cent (neonatal deaths 22.5 per cent) in the group weighing 5 to 6 lb. (2.25 to 2.7 kg.). Mortality fell to 12 per cent in the group weighing 6 to 7 lb. (2.7 to 3.15 kg.), owing to the great reduction in the neonatal death rate to 3.4 per cent; figures for the higher-weight groups remained at this lower level. The foetal mortality rate was 24 per cent where rupture of the membranes had been performed; 30 per cent in the "no treatment" group; 32 per cent in 284 Caesarean sections—ir per cent in 27 mild cases, in some of which placenta praevia was found unexpectedly in the course of an elective section, and 34 per cent in severe cases. Foetal mortality was highest where version had been performed-84 per cent in all cases, 29 per cent in mild cases, and 100 per cent in severe cases. The effect of delay in treatment has been carefully considered. Out of 139 such cases pregnancy continued for over 7 days in 62 (45 per cent). The foetal mortality was 31 per cent in the "immediate" group, and 42 per cent in the "delayed" group. Stillbirth rates were the same (15 per cent) in both groups, but neonatal deaths were much increased in the "delayed" cases (27 per cent compared with 16 per cent for the "immediate" cases); 56 per cent of infants in the "immediate" group and 45 per cent in the "delayed" group reached the "safe" weight of 6 lb. (2.7 kg.) or over. Very similar results were obtained in an analysis of cases treated only by Caesarean section. Conservative treatment is considered to have failed, in that it has not increased the likelihood of the infant reaching the "safe" weight of 6 lb., and has not increased the chance of ultimate survival. Moreover, as it increased maternal mortality and morbidity, conservative treatment is only justified in elderly primigravidae or women with no living children,

and is not advised in the majority of cases of placenta praevia.

Ian T. Fraser

1084. Treatment of Placenta Praevia. A Review of Cases Treated in the Edinburgh Royal Maternity Hospital and Simpson Memorial Pavilion, The Royal Infirmary, Edinburgh, During the Years 1926-1945.

By J. Sturrock. Edinb. med. J., 54, 496-503,

Sept. 1947. 4 refs.

During the period 1926-45, 828 cases of placenta praevia were treated. They are grouped into four 5-year periods to show the changing methods of treatment and the results obtained. In 1926-30 the method most often used was to bring down a leg, with or without the previous use of a pack (110 cases). Much less frequent methods were rupture of the membranes or expectant treatment (34 cases); Caesarean section (27 cases); vaginal pack alone (13 cases); Willett's forceps (3 cases); and hydrostatic bag (1 case). In contrast, during 1941-5 Caesarean section (74 cases) and rupture of the membranes or expectant treatment (74 cases) were most often employed. Willett's forceps were used in 47 cases, and were not considered to carry any special risk of sepsis; in 33 cases a leg was brought down.

Maternal and foetal mortality show a steady decrease in successive 5-year periods. This may be ascribed to various factors; the increasing use of blood transfusion; recognition that many of the minor degrees of placenta praevia were being overtreated; abandonment of the vaginal pack; and decreasing use of the procedure of plugging the lower segment with the half breech, which had resulted in many delayed deaths from shock, after it had appeared that haemorrhage had been controlled. Table I compares the maternal and foetal mortality in the different 5-year periods, and Table II shows the methods of treatment and the

mortality.

Of the 32 maternal deaths 25 were due to haemorrhage and shock, 5 to sepsis (all in the years 1926-35), I to pulmonary embolism, and I to post-anaesthetic vomiting and shock. The foetal mortality of 39 per cent for the period 194I-5 compares unfavourably with that of 23.5 per cent obtained by Macafee of Belfast. Conservative treatment of placenta praevia is still seldom practised in Edinburgh owing to the lack of ante-natal beds, the alleged greater risk to the mother, and the fear of

TABLE I

Per	riod	Cases	Maternal Mortality	
1926-30		188	7.4%	63%
1931-35		209	4.7%	67%
1936-40			3.0%	56%
1941-45		228	° 0.8%	39%

Method of Treatment Cases	Maternal Mortality	
Leg brought down 265 Pack alone 24 Willett's forceps 131 .	7.2% 12.5% 2.3%	88%. 71% 50%
Membranes ruptured or expectant treatment 231 Caesarean section 176 Bag alone 1	1.7% 1.7% Nil	44% 28% Nil

a higher incidence of congenital deformities of the foetus. During the period 1941-5 digital examination was delayed in 6.2 per cent of 674 cases of antepartum haemorrhage, and as a result only 6.1 per cent of cases of placenta praevia were treated conservatively, compared with Macafee's figure of 52 per cent of cases treated conservatively.

Inn T. Fraser

1085. Low Caesarean Section: The Surgical Treatment of Choice in Placenta Praevia. (La césarienne basse. Traitement chirurgical de choix du placenta praevia.)

By J. N. MULLER. Rev. franç. Gynéc. Obstét.,

42, 236-244, July-Sept., 1947.

The author reviews 199 cases of placenta praevia treated by him between 1919 and 1947. Cases treated during 1940-5 are not included. Fifty cases were delivered by lower-segment Caesarcan section. The review has been divided into three parts: (1) 1919-26 (67 cases, 4 lower-segment Caesarcan operations, 2 classical); (2) the transition period 1927-8 (32 cases, 11 lower-segment Caesarcan sections, 1 Caesarcan hysterectomy); (3) 1929-47 (100 cases, 35 lower-segment Caesarcan sections). Of the 50 cases treated by the lower-segment operation, 1 mother died.

The author stresses the importance of admitting the patient to hospital after the first haemorrhage and also the need for avoiding examination and packing before admission. There were 79 foetal deaths in 199 cases of placenta praevia. If those cases are deducted where the foetal heart was not heard on admission and in which the birth weight was under 1,500 g., there remain 31 cases of foetal death (15.5 per cent). The foetal mortality has been halved in recent years. In period (1) there were 67 cases and 15 foetal deaths (22.38 per cent); in period (2) 32 cases and 5 foetal deaths (15.60 per cent); in period (3) 100 cases and 11 foetal deaths (11 per cent). By further exclusions the author reduces the last figure to 8 per cent. The foetal mortality in the cases treated vaginally (146) was 17.7 per cent, when the babies already dead or nonviable were deducted. In period (1) there were 5 maternal deaths out of 67 cases (7.3 per cent); in period (2) 3 maternal deaths out of 32 cases (9.3 per cent); in period (3) 3 maternal deaths out of . 100 cases (3 per cent). The writer advises exteriorization of the whole uterus before incision of the lower uterine segment. In conclusion, a case of cervical placenta praevia accreta is described.

G. Gordon Lennon

1086. Prevention of Repeated Miscarriage.

By L. Kurzrok and C. Birnberg. Amer. J.

Surg., 74, 143-149, Aug. 1947. 11 refs.

The authors record a series of 27 cases of repeated miscarriage treated by anterior-pituitary-like hormone, corpus luteum hormone, and oestrogens. All the patients were delivered at term of live babies without any obstetric complications.

Anterior-pituitary-like hormone, 1,000 to 2,000 units, was given three times a week and corpus luteum hormone, 5 mg. three times a week, until the patient was 41/2 months' pregnant; 1,000 units of anterior-pituitary-like hormone was then given twice weekly and 5 mg. of corpus luteum hormone twice weekly until the eighth month. In addition 0.5 to 1 mg. of a-oestradiol was given daily throughout, the actual dose depending on the estimated degree of genital hypoplasia; in a few cases ethinyl oestradiol, 0.05 mg. three times a day, was used instead. This treatment is based on the belief that the majority of miscarriages are due to faulty implantation and poor penetration of the syncytium in patients who have some degree of hypopituitarism and genital hypoplasia. Results were inconclusive with vitamin E therapy alone, with oestrogen and progestin therapy alone, and "pregneninoline"; one patient showed hirsutism after taking the last-named for 4 to 5 months in doses of 20 mg. daily in the second half of the cycle.

The rationale of the authors' therapy lies in: (1) the finding of weak by positive, or of negative, Aschheim-Zondek reactions in patients subsequently proved to be pregnant, thus indicating poor production of gonadotrophic hormone; (2) the frequent occurrence of miscarriage at 3 to 3½ months and in women showing some evidence of hypopituitarism and genital hypoplasia, that is, at a time when the placenta should be taking over the endocrine functions of the degenerating corpus luteum. Serum gonadotrophin values fall if the foetus dies, though it has not yet been clearly shown whether this fall occurs before or after the death of the foetus.

The authors do not consider that the Rh factor plays any part in repeated miscarriage. They do not regard their therapy as a panacea for all miscarriages, but offer it as a successful advance in the endocrine therapy of miscarriage.

Hugh R. Arthur

1087. Abortions: A Study with Emphasis on Treatment.

By P. Peterson. Amer. J. Obstet. Gynec., 54, 251-258, Aug. 1947. 6 refs.

This review covers a 10-year period from June 30,1936, to July 1, 1946, when 6,105 viable babies and 937 spontaneous abortions were observed by the author. The incidence of abortion was 15.35 per cent. An Aschheim-Zondek or Friedman test was performed on all cases of threatened abortion before treatment was started. Pregnancy tests were negative on admission in 292 out of 581 patients. The table below, which is taken from the text, lists the conditions thought to be responsible for the abortion.

Condition	No. of cases	e' '0
Infantile uterus	77	13.2
Retro-displaced uterus	158	27.2
Low prothrombin level	19	3.2
Low oestrogen effect	168	28.9
Habitual aborters		
Low pituitary effect	37	6.3
Low progesterone effect	54	9.3
Low oestrogen-progesterone		11.7

In the series there were no abnormalities due to tumours, infections, or laceration of the cervix, neither did thyroid dysfunction play a part. No abortion was related to the effect of alcohol, lead, diabetes, or incompatibility of the Rh factor. The paternal influence was almost negligible. Vitamin E was of no demonstrable value. Progesterone may be harmful, and the author's results have been better since he gave up using it; in his opinion oestrogen therapy is more rational. He found a direct relation between the low glycogen content vaginal mucosa endometrium and diminished secretion of gonadotrophic hormone. The author considers that the causes of abortion may be grouped as: (1) maternal or environmental, and (2) ova with defective germ plasm.

There were three periods of treatment: (1) preconception, (2) post-conception, and (3) period of threatened abortion. Infantile uterus was treated by administration of 0.5 mg. of diethylstilboestrol in the first half of the cycle, followed by 10 mg. progesterone daily (orally) with I mg. diethylstilboestrol after the estimated day of ovulation to within 3 and 5 days, respectively, of the expected menses. Treatment was given for 3 consecutive months, then omitted for 3 months. A dilatation and curettage was performed at the end of each 3 months for endometrial study and reflex stimulation of the uterus. In the case of retrodisplacement of the uterus, 3 months after the miscarriage the uterus was replaced and a pessary inserted. If this failed, the uterus was replaced surgically and the pessary was left in place for the first 3 months of pregnancy. If abortion threatened, the patient was nursed in the prone position and in some cases a mercury bag was inserted into the vagina.

In cases in which there was a low prothrombin level 2 mg. of synthetic vitamin K was given intravenously daily for 6 days in the week preceding each period. If the prothrombin level was maintained, by increasing the dosage if necessary, the patient did not abort. Where oestrogen effect was low, during the waiting period of 3 months after miscarriage 0.5 mg. of diethylstilboestrol was given daily in the proliferative phase, and r mg. in the secretory phase until 5 days before the expected When pregnancy was being attempted I mg. doses were given without interruption. If the period was I week late 5 mg. daily was prescribed and the dose increased by 5 mg. every 2 weeks until the seventh month, and then reduced by 5 mg. every 10 days until it was completely withdrawn or delivery took place. If the administration was not stopped 3 weeks before the expected date of confinement these patients usually went past term. If bleeding occurred the dose was further increased by 5 mg. daily until symptoms were relieved.

The author considers that the group with low gonadotrophic effect comprises those cases of habitual abortion most amenable to treatment. Before conception 300 units of chorionic gonadotrophic hormone was administered twice weekly during the secretory phase, 0.5 mg. diethylstilboestrol was given daily during the proliferative phase, and I mg. diethylstilboestrol plus 10 mg. progesterone daily during the secretory phase up to within 3 and 5 days of the expected period. If pregnancy occurred the diethylstilboestrol was increased to 5 mg. twice daily and progesterone to 10 mg. three times daily with parenteral injections of each in cases of bleeding. The chorionic gonadotrophic hormone was increased to 500 units twice weekly. This treatment was given for 5 months of pregnancy. Thereafter it was felt that the placenta would supply sufficient hormone. At 7 months the treatment was started again and continued for 6 weeks. It was considered important that these patients should have a 20 per cent protein diet. The results of treatment in the group with low progesterone effect were not satisfactory. Missed abortion was particularly common. Treatment of the group with low oestrogen-progesterone effect gave only slightly better results than in the preceding group.

In cases of habitual abortion the author had 64 per cent of successes with his treatment as against a figure of some 27 per cent in untreated cases. The percentage of successes in non-habitual abortion was 98.6 per cent.

G. Gordon Lennon

1088. Blood Count, Takata-Ara Reaction Erythrocyte Sedimentation Rate, and Cell Mass in Incomplete Abortion Followed by Operative Intervention on the Uterus. Diagnostic and Prognostic Value in the Postabortive Period. (Esame emocitometrico, reazione di Takata-Ara, velocita di sedimentazione e massa

globulare negli aborti incompleti seguiti da revisione della cavita uterina. Valore diagnostico e prognostico del decorso puerperale abortivo.)

By A. DE MARCHI. Arch. Ostet. Ginec., 52,

361-371, Nov.-Dec., 1947. 2 figs., 29 refs.

This paper, read at the Obstetrical and Gynaecological Congress in Florence, in November 1946, is based on investigations carried out at the Obstetrical and Gynaecological Clinic of the University of Padua. Its scope is indicated by its title.

A hundred cases of incomplete abortion, subdivided into febrile and afebrile groups, and 22 control cases of complete, spontaneous and afebrile abortion were compared with each other. The tests mentioned in the title were performed: (1) on admission to hospital; (2) two days after surgical evacuation of the uterus; and (3) two days later. [For details of the figures obtained the original article must be consulted.]

The author arrives at the following conclusion. In spontaneous complete and incomplete abortions the erythrocyte sedimentation rate (E.S.R.) is higher than in women who are not pregnant or are in early pregnancy. In the post-abortive period, study of the E.S.R., together with the leucocyte count and estimation of the erythrocyte volume, and sometimes also with the Takata-Ara reaction, will demonstrate the presence of a complication. The E.S.R. represents a diagnostic and prognostic aid superior to all the other tests employed and, while not absolutely specific, may be valuable as a test in ambulatory patients.

N. Alders

1089. Deaths Following Use of Abortifacient Paste. Report of Two Cases.

By W. Kulka. Amer. J. clin. Path., 17, 723-

727, Sept. 1947. 2 figs., 9 refs.

The necropsy findings are described in 2 patients in whom death followed the injection of an abortifacient paste. In r patient, death occurred 21/2 months after the attempted abortion. Necrosis of the uterine wall, parametrial abscesses, and generalized peritonitis were found. The second patient died suddenly of pulmonary embolism within a few hours after an attempt to cause abortion by intrauterine injection of the paste. The emboli were composed of fatty material and particles from the damaged chorionic villi. There was necrosis of some of the villi and vessels of the uterine wall, but no apparent changes in the embryo or the embryonic sac. The presence of a pasty material was demonstrated by the technique used routinely for the demonstration of fat, but the staining reaction was different from that of fat .-[Author's summary.]

1090. Peritonitis after Abortion. (Nuevas consideraciones sobre peritonitis post-aborto.)

By G. VILLAVICENCIO. Bol. Soc. chil. Obstet. Ginec., 12, 212-221, Sept. 1947. 12 refs.

1091. The Placental Site in Vesicular Mole. (Il situs placentaris nella mola vescicolare semplice.)

By L. DE GIORGI. Arch. Ostet. Ginec., 52, 321-

339, Nov.-Dec., 1947. 5 figs., 11 refs.

The author reports in detail on 4 cases of vesicular mole, observed at the Obstetrical-Gynaecological Clinic of the University of Naples between 1925 and 1945.

At varying intervals after spontaneous expulsion of the mole (2, 15, 36, and 37 days respectively), subtotal or total hysterectomy and excision of both appendages were performed and the placental site was examined macroscopically and histologically. The reason for this rather drastic operative interference is not stated in the first two patients, one of whom was only 20 years old, but appears to have been moderate haemorrhage in the remaining two The Friedman reaction was repeatedly negative in one of these.] Macroscopical investigation showed that the placental site was still recognizable 15 days after expulsion of the mole, but no trace of it could be found after 36 days. Histologically, there was an abundance of trophoblastic elements, situated in the decidua and in the superficial layers of the myometrium, and already some necrosis and lymphocytic infiltration, 2 days after expulsion of the mole.

After 15 days there were signs of regeneration of the mucous membrane, of more regression and necrosis of trophoblastic elements, which were still present in small accumulations, and of more small-celled infiltration. The ectodermal elements survived for a long period, being recognizable in groups, situated invariably between the (fully regenerated) mucous membrane and the myometrium and surrounded by lymphocytes, leucocytes, and fibroblasts, as late as 37 days after expulsion of the mole.

N. Alders

1092. Lesions of the Cervix in Relation to Pregnancy.

By G. Hill. Med. Press, 219, 335-337, April 14, 1948.

1093. Pregnancy and Fibroids. (Grossesse et fibromes.)

By G. GEERAERT and R. VOKER. *Brux méd.*, 28, 765-777, Apr. 11, 1948. 4 figs., Bibliography.

1094. Factors in the Treatment of Chorion-epithelioma.

By A. W. Holman and E. H. Schirmer. *Amer. J. Obstet. Ginec.*, 55, 629-635, Apr. 1948. 12 refs.

1095. Chorioncarcinoma.

By P. PERNWORTH. Amer. J. Surg., 75, 521-523, Mar. 1948. 2 refs.

1096. A Rare Case of Hypertrophy of the Breast during Pregnancy. (Rzadki przypadek przerostu sutków w przebiegu ciazy.)

By A. Ber and I. Herbstowa. *Polsk. Tyg. lek.*, 2. 1057-1061, Sept. 1947. 4 figs., 22 refs.

A woman, aged 25, was admitted to hospital during the second month of pregnancy on account of the enormous enlargement of her breasts. The right breast had a circumference of 60 cm., and the left breast of 56 cm. The breasts had been gradually increasing in size since the beginning of pregnancy. Possible causes of the unusual hypertrophy were considered: (1) excessive production of oestrogenic hormone or of progesterone; (2) exceptional response of the gland tissue of the breast to the stimulation of the hormones. Three kinds of treatment were tried. First, large doses of progesterone were given as an antidote to the oestrogenic hormones, then large doses of oestrone were administered as an antidote to the progesterone, and finally X-ray irradiation of the breast was carried out in the hope of lessening the response to hormone stimulation. None of these treatments was successful. Because of the continuing enlargement of the breasts the pregnancy was terminated at the fourth month. The breasts then diminished in size somewhat, but as they became enlarged and painful during every menstrual period, partial amputation was advised.

C. Uhma

1097. Weakness of the Lower Extremities as a Complication of Pregnancy.

By H. W. NEUMANN. Cincinatti J. Med., 29, 149-162, Mar. 1948. 23 refs.

1098. Vitamin B, Deficiency in Pregnancy and Icterus Neonatorum. (Vitamin-B,-mangel während der Schwangerschaft und Icterus der Neugeborenen.)

By A. CATTORI. *Praxis*, 37, 229-231, Apr. 1, 1948.

1099. Heart Disease and Pregnancy. By J. A. HARDY. Mississippi Valley Med. J., 70, 49-52, Mar. 1948. 2 refs.

1100. Pregnancy and Coronary Insufficiency. (Schwangerschaft und "Coronarinsuffizienz".)

By H. SIEDEK and R. WENGER. Wien. klin. Wschr., 59, 696-700, Oct. 24, 1947. 2 figs., 63 refs.

Between July 1946 and May 1947, 532 pregnant women were studied electrocardiographically and changes typical of coronary insufficiency were found in 73. Of the entire series there were no grounds in 490 patients for anticipating such a finding, yet 59 (12 per cent) of these showed abnormal changes. The changes were particularly found in the second and third months of pregnancy, practically never in the fourth and fifth months; they became commoner again late in pregnancy. It is suggested that the presence of coronary insufficiency early in pregnancy implies that the heart has not yet adapted itself to its extra load. condition is not an indication for interrupting S. S. B. Gilder pregnancy.

1101. Complete Heart Block in a Case of Pregnancy.

By R. M. Barton and C. N. LaDue. Amer. J. Med., 4, 447-451, Mar. 1948. 2 figs., 16 refs.

1102. Full-term Pregnancy with Syncopal Attacks in Dorsal Position. (Fullgatt svangerskap med synkoptiske anfall i ryffleie.)

By N. CLEMETSEN. Nord. Med., 37, 422-424,

Feb. 27, 1948. 2 figs., 4 refs.

1103. Significance of the Rh Factor in Obstetrics. (Die Bedeutung des Rhesusfaktors für die Geburtshilfe.)

By M. A. Frelin von Finck. Z. Geburtsh. Gynäk., 129, 1-22, 1948. 16 figs., 26 refs.

1104. Leukaemia and Pregnancy. (Leucemia e gravidanza.)

By G. Lugo. Mon. ostet.-ginec., 18, 213-237, July-Dec. 1947. 1 fig., Bibliography.

1105. Electroshock Treatment in Pregnancy. (Electroshocktherapie en zwangerschap.)

By A. M. PLENTER. Ned. Tijdschr. Geneesk., 92, 1079-1082, Apr. 10, 1948.

1106. Right Hemiplegia and Aphasia at Term. (Sindrome de hemiplejia derecha y afasia al final de gestación.)

By B. Guilera Molas. Med. esp., 19, 3-6, Jan.

1948.

1107. Observations on Pseudocyesis during the Late War. (Beobachtungen über eingebildete Schwangerschaft während des letzten Krieges.)

By R. K. KEPP. Dtsch. med. Wschr., 73, 120-

122, Mar. 12, 1948. 4 refs.

1108. Pregnancy in the Diabetic.

By L. J. Palmer, J. H. Crampton and R. H. Barnes. West J. Surg. Obstet. Gynec., 56, 175-177, Mar. 1948. 5 refs.

1109. Diabetes and Pregnancy. (Diabetes e gravidez.)

By G. FRIOZZI. Rev. Ginec. Obstet., 42, 210-214, Mar. 1948. 2 refs.

1110. Diabetes in Pregnancy.

By R. A. Reis. J. Iowa med. Soc., 38, 41-45, Feb. 1948.

1111. Pregnancy Complicating Tuberculosis. A Survey for an Eleven-year Period.

By C. J. Barone, J. A. Fino and L. H. Hetherington. Amer. J. Obstet. Gynec., 54,

475-487, Sept. 1947. 1 fig.

During the 11 years from January 1930 to January 1941, 28,846 patients were delivered at the Elizabeth Steel Magee Hospital, Pittsburg. Of these, 103 (0.35 per cent) were known to have pulmonary tuberculosis, but the records of 41 patients were incomplete. A clinical survey for a period of 5 to 15 years was made on the remaining 62

patients. The mortality rate in the series was 33.8 per cent, when corrected by the exclusion of 2 deaths (1 of proved tertiary syphilis, and 1 of collapse during thoracoplasty), the mortality rate was 30.6 per cent. The mortality rate was 19.2 per cent among those delivered spontaneously, 36.3 per cent when delivery had been by Caesarean section, and 38.5 per cent where pregnancy had been terminated in the first trimester. Moderately or greatly advanced activity of the disease was present in 61.5 per cent of the 62 patients, and 44.8 per cent of these are dead. The best results were obtained in patients delivered spontaneously, irrespective of the extent of the tuberculosis.

Anthony W. Purdie

By C. J. Stewart and F. A. H. SIMMONDS. *Brit.* med. J., 2, 726-729, Nov. 8, 1947. 16 refs.

In January 1944 the authors decided to keep a central register of pregnancies in women attending chest clinics in the county of Middlesex in order to determine what influence, if any, child-bearing has upon the course of pulmonary tuberculosus disease. The influence of "infant-rearing"—the extra effort needed after the birth of the child—was not considered.

The population of the county was estimated at 1,900,000, and in 1944 there were 4,200 tuberculosis females of child-bearing age on the chestclinic registers. Up to June 1946, 236 of these females became pregnant. From all the married women of child-bearing age on the registers of two Middlesex clinics, 321 who had had no pregnancy between January 1943 and June 1946 were used as a control group. Of the pregnant patients, 50 (21.2) per cent) were considered to have active or progressive disease; while in the control group 114 (35.5 per cent) had the same degree of activity; 166 (70.3 per cent) of the pregnant cases, and 125 (38.9 per cent) of the non-pregnant controls were considered to have quiescent or arrested disease. For various reasons, records were inadequate in respect of the remaining cases and controls. The state of the disease was assessed at the beginning of pregnancy, or as regards the controls as near to January 1944 as possible, and compared with the state 12 to 15 months later. The pregnant patients were separated into those that went to term and those in whom the pregnancy was surgically terminated.

Tables are given showing the striking similarity of the results in the pregnant and non-pregnant groups, both with active and non-active disease. Of 50 pregnant and 114 non-pregnant women with active disease, signs and symptoms became quiescent in 35 per cent of each group; 30 to 40 per cent deteriorated or died. Of the non-active cases, comprising 166 pregnant and 125 non-pregnant women, the condition deteriorated in 8 to 12 per cent of each group, but there were no deaths. Patients whose pregnancy was artificially ter-

minated fared no better than those allowed to continue to term. All the cases and controls were carefully analyzed for: (1) age, (2) social class, (3) number of previous pregnancies, (4) duration of the disease, and (5) activity or quiescence of the disease. The authors show statistically that in those with active disease there was no significant difference between cases and controls under headings (1), (2), (3), or (4), but that in the quiescent group the age-composition as between the pregnant cases and the non-pregnant controls was different. There was a larger proportion of women under 30 amongst the pregnant.

The authors conclude that pregnancy has little or no effect on the progress of active or quiescent pulmonary disease over a period of 15 months, and that there is no evidence that surgical termination of pregnancy is necessary except in a few selected cases.

R. J. Lumsden

1113. Further Development of Pulmonary Tuberculosis after Childbirth. (Evolución de la tuberculosis pulmonar después del parto.)

By V. M. Aviles, F. Rodriguez and J. Oneto. Obstet. Ginec. lat.-amer., 5, 273-298, July 1947.

8 figs., 17 refs.

After reviewing the widely varying views in the literature on the effect of pregnancy on tuberculosis, the authors describe, with full clinical details, a series of cases seen in Santiago. Tuberculosis was diagnosed in 658 of 32,953 obstetrical cases, an incidence of 1.99 per cent. Eighteen patients out of the 658 died as a result of tuberculosis; this mortality rate of 2.75 per cent is considered low in view of the serious prognosis hitherto in cases where these two conditions are associated. A detailed study was made of 43 cases for periods varying between 3 months and 2 years or more. In 28 per cent of these, the disease was aggravated, in 30 per cent there was no change, and in 42 per cent there was improvement. The corresponding figures in 31 cases in which therapeutic abortion was carried out were 42, 29, and 29 In 10 cases of productive tuberculosis per cent. there was an aggravation in 10 per cent, no change in 60 per cent, and improvement in 30 per cent. In 12 cases of exudative tuberculosis the corresponding figures were 58, 8, and 33 per cent, and in 21 cases with mixed lesions, 19, 28, and 52 per cent. Study of the results according to the extent of the lesions showed that there was aggravation in 50 per cent with advanced lesions, in 26.66 per cent with moderate lesions, and in 20 per cent with minimal lesions. There was improvement in 37.51 per cent with advanced lesions, in 46.66 per cent with moderate lesions, and in 40 per cent with minimal lesions. Patients between the ages of 25 and 35 are those most likely to suffer from aggravation of the condition, and the risk of this is also greater in multiparae than in primiparae. Rest, sanatorium treatment, and modern surgical methods have contributed to the good results. Bryan Williams

1114. Bilateral Renal Tuberculosis in Pregnancy. By H. R. NEWMAN and H. LEVINE. Connecticut med. J., 12, 119-120, Feb. 1948. 6 refs.

1115. Tuberculosis and Pregnancy. (Tuberculose e gravidez.)

By A. DE PAULA and R. G. SIMONARD SANTOS. *Rev. méd. munic.*, 11, 125-158, Oct.-Dec., 1947. 33 figs., 16 refs.

1116. Rubella in Pregnancy and Congenital Deformities in the Child. (Rubeola under graviditet och kongenitala missbildningar hos barnet.)

By M. ZEWI. Nord. Med., 37, 416-418, Feb. 27,

1948. 23 refs.

1117. A Case of Foetus Pseudo-amorphus.

By J. SVEJDA. J. Path. Bact. 59, 647-655, Oct. 1947. 5 figs., 19 refs.

III8. Twin Pregnancy with Hydramnios in One Amniotic Sac: Radiological Diagnosis. (Embarazo gemelar con polihidramnios de uno de los huevos. Contribucion a su diagnóstico radiológico.)

By J. LEON. Sem. méd., 55, 414-417, Mar. 11,

1948. I fig.

1119. Radiographs of an Anencephalic with Spina Bifida in Utero. (Radiographies d'anencéphale presentant un spina-bifida in utero.)

By —. Cleisz and —. Bret. Gynec. et Obstet.,

47, 177, 1948. 2 figs.

1120. Diagnosis of Foetal Ascites in Pregnancy. (Diagnóstico de la ascitis fetal durante el embarazo.)
By P. Puig y Roig. Med. esp., 19, 117-123,

Jan. 1948. 2 figs.

1121. Early and Late Ectopic Pregnancy.

By F. E. WHITACRE and H. D. LYNN. J. Michigan med. Soc., 47, 285-288 and 338, Mar. 1948.

1122. The Diagnosis and Treatment of Ectopic Pregnancy.

By H. H. WARE. West Virginia med. J., 44, 49-52, Mar. 1948. 13 refs.

1123. Recurrent Extrauterine Pregnancy. (Considerazioni sulla gravidanza extrauterina recidivante.)

By M. Bertani. Mon. ostet.-ginec., 18, 190-210, July-Dec. 1947. 4 figs., 23 refs.

1124. A Case of Extra-uterine Pregnancy Going to Full Term.

By R. L. Paterson and H. Currie. S. Afr. med. J., 22, 229-230, Mar. 27, 1948.

1125. Observations on Thirteen Cases of Late Extrauterine Pregnancy.

By H. H. Ware. Amer. J. Obstet. Gynec., 55, 561-582, Apr. 1948. 18 refs.

1126. Chemical Diagnosis of Extrauterine Pregnancy. (Die chemische Diagnose der Extrauterinschwangerschaft.)

By D. Stucki. Gynaecologia, Basel, 125, 44-47.

Jan.-Feb., 1948.

1127. Simultaneous Intra-uterine and Extra-uterine Pregnancy.

By R. W. Devoe and J. H. Pratt. Proc. Mayo Clin., 23, 166-168, Mar. 31, 1948. 3 refs.

1128. A Case of Cervical Pregnancy at Term. (Un caso de embarazo cervical a término.)

By R. Fuster Chiner and J. A. Queralt Ballester. Med. esp., 19, 82-88, Jan. 1948. 16

1129. Secondary Abdominal Pregnancy with Survival of the Foetus and Mother.

By G. H. Moore. Med. J. Aust., 1, 405-407, Mar. 27, 1948. I ref.

1130. Abdominal Pregnancy with Report of Two Cases.

By F. E. HAGIE. J. Indiana med. Ass., 41, 305-307, Mar. 1948. 3 figs.

1131. Full Term Intra-abdominal Ectopic Pregnancy. (Surgical Treatment of Five Cases.)

By C. Bowesman and A. H. CHENARD. Irish I. med. Sci., 132-136, Mar. 1948. I fig., 3 refs.

1132. Abdominal Pregnancy at Term Secondary to Uterine Rupture. (Embarazo abdominal a termino secundario a rotura uterina.)

By F. P. Acosta. Rev. méd. quirúrg. Oriente., 8, 212-216, Dec. 1947. 3 refs.

1133. Unruptured Primary Ovarian Pregnancy. By S. S. WITTENBERG and R. G. RIES. Amer. J. Surg., 75, 618-623, Apr. 1948. 2 figs., 39 refs.

1134. Two Cases of Primary Ovarian Pregnancy. (Due casi di gravidanza extra-uterina primitiva ovarica.)

By M. Opocher. Mon. ostet.-ginec., 18, 269-280, July-Dec. 1947. 4 figs., 19 refs.

1135. Endometrioid Changes and Decidual Reaction in the Pathogenesis of Tubal Pregnancy. (Metamorfosi endometrioide e reazione deciduale nel meccanismo patogenetico della gravidanza tubarica.)

By S. Valenti. Ginecologia, Torino, 14, 65-91,

Feb. 1948. 4 figs., Bibliography.

1136. Interstitial Pregnancy. (Interstitiel graviditet.)

By N. CLEMETSEN. Nord. Med., 37, 403-404, Feb. 27, 1948. 17 refs.

# LABOUR.

1137. The Key to Painless Childbirth.

By G. Rees. S. Afr. med. J., 22, 210-213, Mar. 27, 1948.

1138. A Study of the Perineum in Labour. (Contribuição ao estudio do períneo no parto.)

By L. Rodrigues De Lima Gouvea. Arch. brasil. Med., 37, 269-337, Oct.-Dec., 1947. 40 figs., Bibliography.

1139. Cholinergy in Labour and the Puerperium. (Colinergia e stato puerperale.)

By L. Nobili. Riv. ital. Ginec., 31, 198-204, 1948. 7 refs.

1140. Graphic Registration of Uterine Contraction in Three Labours Induced Near Term. (Enregistrements graphiques de la contraction uterine au cours de trois accouchements provoqués au voisinage du terme.)

By H. Pigeaud and L. Baré. Gynécologie, 44, 265-268, Sept.-Oct. 1947. 3 figs.

1141. Elective Induction of Labor.

By R. M. GRIER. Amer. J. Obstet. Gynec., 54,

511-516, Sept. 1947. 4 refs.

The incidence of induction of labour at the Evanston Hospital was 10.9 per cent from 1935 to 1940 and 14.4 per cent from 1940 to 1945. Because of this increase the author decided to make a detailed study of the effects of induction during I further year. [These results cannot usefully be compared with those published in Britain, as they were obtained from the "precipitation of imminent labour" in a selected series of women.] Of the 129 inductions (10 per cent of all deliveries) only 6 were therapeutic—4 for severe toxaemia and 2 for marginal placenta praevia. The others were particularly favourable cases, in that there was no cephalo-pelvic disproportion, the head was engaged or dipping into the pelvis, the baby was mature and presented by the vertex, and the cervix was soft, partially effaced, and dilated to at least I cm.; in 62 cases the cervix was moderately to completely effaced and more than I cm. dilated. Only one induction failed, and only 5 were associated with morbidity. There were I macerated stillbirth and I neonatal death from atelectasis. The latent period from rupture of membranes to onset of pains averaged 4 hours ± 29 minutes in primigravidae and 55 minutes ± 5 minutes in multigravidae. The corresponding figures for length of labour were 6 hours 56 minutes and 4 hours 8 minutes respectively. Both latent period and length of labour were much diminished in the 62 women whose cervices were more than I cm. dilated, and in the 51 women in whom the head was less than I cm. above the ischial spines. Posterior positions of the occiput did not appear to influence induction time or length of labour.

When the conditions described above are found by rectal examination the patient is offered elective induction of labour. After an enema 10 ml. of 10 per cent calcium gluconate is given intravenously, and within 2 hours the membranes are ruptured below the head. If labour has not begun

in 2 hours, 1-minim doses of pitocin are given intramuscularly at 1/2- to 1-hour intervals. Castoroil and quinine have been abandoned. calcium gluconate is thought to raise the ratio of ionized to non-ionized calcium and so to increase Aileen Dickins uterine contractility.

1142. Induction of Labor at the Chicago Lying-in

Hospital.

By W. J. DIECKMANN and R. B. McCREADY. Amer. J. Obstet. Gynec., 54, 496-510, Sept. 1947.

Since 1933 the authors have tried to reduce maternal and foetal mortality by progressively limiting the number of inductions of labour and attempting to select the optimum time for them. They no longer induce labour for post-maturity and contracted pelves, and do so much less often Their indications now include for toxaemia. placenta praevia (when it is not total and there is some cervical dilatation), accidental haemorrhage, eclampsia (after 4 to 6 hours' medical treatment, and where there is some cervical dilatation), severe toxaemia, some cases of cardiac disease, pulmonary tuberculosis, anaemia, diabetes, habitual intrauterine death of the foetus, hydramnios, and twin pregnancy. They are opposed to induction of labour for the convenience of doctor or patient. Patients whose membranes have ruptured prematurely are given pituitary extract only if the cervix is "ripe".

When induction of labour is contemplated a vaginal examination is made to determine the condition of the cervix, pelvis, and presenting part, and to exclude prolapse of cord. If the cervix is ripe (that is, effaced with the margins 0.4 to 1 cm. thick and soft in a primigravida or 2 cm. dilated in a multipara) the membranes are stripped as high as possible. The following morning, after an enema, pituitary extract is given, or the membranes are ruptured below the head or a bag is inserted. These are the only methods employed. Pituitary extract (preferably "pitocin") is given in doses of ½ unit, 1 unit, 2 units, 3 units, and 3 units at 20-minute intervals. Each dose is given only if contractions are absent or weak, and the drug is used either alone or 8 to 12 hours after artificial rupture of the membranes if contractions have not begun.

During 30 months, induction was attempted in 7.3 per cent of all deliveries; over the same period there were 4 per cent Caesarean sections. Of the inductions 9 per cent failed. Five Caesarean sections were performed on the failures. There were 2 maternal deaths in the 276 cases in which induction was successful—I due to accidental haemorrhage, cortical necrosis of the kidney, necrosis of the pituitary, and eclamptic liver changes, and and the other due to a ruptured uterus produced during delivery of an impacted shoulder. There were 17 foetal deaths.

maternal morbidity was 14.7 per cent, compared with an average hospital morbidity of 9 per cent. The average latent period between induction and the onset of labour varied from 1.5 to 7.7 hours. The average length of labour was also short, and the authors gained the impression that labour after artificial rupture of the membranes was shorter than after spontaneous rupture.

[The authors do not state what is done when termination of pregnancy is clearly and perhaps urgently indicated but the cervix is not ripe. Presumably the induction is delayed or a Caesarean section performed. A discussion on this troublesome type of case would have been valuable.] Aileen Dickins

1143. Induction of Labor.

By H. Guyot. Manitoba med. Rev., 28, 179-183, Apr. 1948.

1144. The Management of Difficult Labor. By T. K. Brown. Nebraska St. med. 1., 33, 3-7, Jan. 1948. 12 refs.

1145. Septate Vagina as a Cause for Dystocia in Labor.

By W. J. Reich and M. J. Nechtow. J. Lancet, 68, 66-67, Feb. 1948. 1 fig., 10 refs.

1146. Effect of Intravenous "Spasmalgine" on Uterine Contraction and the Course of Labour in the Primipara. (Action de la spasmalgine intraveineuse sur la contraction utérine et la marche du travail chez la primipare.)

By H. PIGEAUD and A. NOTTER. Gynéc. et

Obstét., 47, 60-65, 1948. 1 fig., 9 refs.

1147. Protrusion of the Acetabula as Complication of Labor. [In English.]

By J. Petersen. Acta radiol., Stockh., 29, 205-214, Mar. 1948. 3 figs., 12 refs.

1148. Dystocia due to a Double Monster. (Distocia por monstruo doble. Caso clinico.)

By C. THONET. Bol. Soc. chil. Obstet. Ginec., 12, 221-225, Sept. 1947. I fig.

(Sobre presentación de 1149. Transverse Lic. tronco.)

By M. VASQUEZ ZUNIGA. Bol. Soc. chil. Obstet. Ginec., 12, 236–246, Oct. 1947. 2 figs.

1150. Primary Face Presentation. By S. Brody. New York St. J. Med., 48, 525-526, Mar. 1, 1948. 3 figs., 3 refs.

1151. More Experiences with Bracht's Method in Breech Delivery. (Mayor experiencia con la maniobra de Bracht en la atención del parto pelviano.)

By A. González Collazo and N. O. DI Fonzo. Prensa méd. argent., 35, 323-325, Feb. 20, 1948. 1 fig., 12 refs.

1152. Prophylactic Intrapartum and Postpartum (Sulfamido-Intravaginal Sulphonamide Therapy.

terapia vaginal. Intra y post-partum profilactica de la infeccion puerperal.)

By J. Leon. Rev. Ginec. Obstet., 1, 142-149, Feb. 1948. 2 figs.

1153. Manual Removal of the Placenta. A Report of 410 Cases of Manual Removal of the Placenta with One Death; 150 of the Cases were done as a Routine or Prophylactic Measure.

By H. W. MAYES. West. J. Surg. Obstet. Gynec., 55, 483-490, Sept. 1947. 11 refs.

In 12½ years at the Methodist Hospital, Brooklyn, New York, out of a total of 22,264 vaginal deliveries there were 260 cases of manual removal of the placenta. There was only I death, a mortality rate of 0.4 per cent. The corrected morbidity rate was 9.2 per cent. In the majority of these cases there had been repeated attempts at expression by the Credé method, after which manual removal was undertaken, usually within 20 to 30 minutes. Of these 260 patients 151 had had spontaneous deliveries and 109 operative (88 low forceps, 12 mid-forceps, and 9 bag inductions). There were 100 primiparae and 160 multiparae in the series.

The excellent results obtained suggested to the author a controlled study of early manual removal of the placenta, and he reports on 234 personal cases with 150 manual removals over a period of ro months. The majority of the manual removals were carried out within 4 minutes of delivery. There were no deaths in the series and the morbidity rate was 2 per cent, corrected to 0.66 per cent. In all these cases, as in the previous 260, vaginal antisepsis had been employed before and during delivery. This technique of vaginal antisepsis, which involves the frequent treatment of the perineum and vagina with 2 per cent "mercurochrome", is described in detail; before manual removal of the placenta further antiseptic precautions are taken by the use of 2 per cent acetone-alcohol solution of mercurochrome and 2 per cent mercurochrome in glycerin. Of the 150 cases there was spontaneous delivery in 33 and operative delivery in 119 (75 prophylactic, 33 low-, S mid-, and I high-forceps).

The series was divided into three groups, each of 50 cases. In Group 1, 10 units of pituitrin was given intramuscularly immediately after delivery and gr. 120 (0.2 mg.) of "ergotrate" (ergometrine) intramuscularly after delivery of the placenta. In Group 2, gr. 320 ergotrate was given intravenously on delivery of the child. In Group 3, no oxytocic was used until delivery of the placenta, when 10 units of pituitrin were given intramuscularly and about 10 minutes later gr. 320 (0.2 mg.) ergotrate intramuscularly. A comparison of the three groups showed that in Groups 1 and 2 separation of the placenta occurred more easily. Intravenous ergotrate before delivery of the placenta (Group 2) seemed to produce a more rapid separation of the placenta

than intramuscular pituitrin given at the same time (Group 1). Blood loss was less when oxytocics were used. In Group 3 it was found advisable to wait 5 minutes after delivery before manual removal was attempted, as bleeding was greater if removal was attempted earlier.

The author considers that his figures should encourage manual removal when a difficult third stage is expected, but remarks that where vaginal antiseptics are not used routinely sulphonamides and penicillin should be given. Manual removal of the placenta is not recommended as a routine procedure.

E. L. Nicholson

1154. The Placental Stage and Postpartum Hemorrhage.

By W. J. DIECKMANN, L. D. ODELL, V. M. WILLIGER, A. G. SESKI, and R. POTTINGER. Amer. J. Obstet. Gynec., 54, 415-427, Sept. 1947. 4 figs., 39 refs.

In the management of the third stage of labour the authors have investigated the technique advocated by Davis and Boynton (Amer. J. Obstet. Gynec., 1942, 43, 775) in which intravenous administration of "ergotrate" (ergometrine maleate) is advised at the time of delivery of the anterior shoulder, followed by a pause of 30 seconds in the delivery of the trunk, intended to allow time for the ergotrate to act. Davis and Boynton found with this technique that the placenta could be expressed within 3 minutes in 72 per cent of cases. These findings have been fully confirmed by the present authors, but they had results almost equally favourable after the administration of "ergotrate", of posterior pituitary extract, and of normal saline. They therefore concluded that the major factor in the short third stage was the pause of 30 seconds, and began an investigation into the effects of delivering the anterior shoulder, waiting 30 seconds, delivering the posterior shoulder, injecting 1 ml. of unknown solution, waiting 30 seconds, and then slowly delivering the baby. In primigravidae the average time occupied in the delivery of the trunk of the child has been 31/4 minutes. In 90 per cent of cases delivery of the placenta was completed within 3 minutes of the birth of the child. Again there was no substantial difference in regard to duration of third stage between the groups to whom ergotrate, pituitrin, or normal saline was administered, but heavier third stage and postpartum bleeding were observed in the group given normal saline. They believe this may be attributable to the high proportion of deliveries under anaesthesia, and state that an oxytocic is essential in such circumstances. They have found I unit of posterior pituitary extract to be more effective than 0.2 mg. of ergotrate. The effect of larger doses of ergotrate is now being investigated. If it proves impossible to deliver the placenta by compression of the uterus (with cord traction when the placenta enters the vagina) the authors believe

that little is to be gained from waiting for placental separation, and standard instructions to their resident staff are "to remove the placenta manually within I hour at a maximum, and usually within I5 minutes after delivery". These instructions apply only to retained placenta without haemorrhage. The occurrence of any significant third-stage haemorrhage is an indication for removing the placenta at once.

In the management of haemorrhage after the third stage the authors advocate repetition of the intravenous injection of the original oxytocic; inspection of the vulva, vagina, and cervix; manual exploration of the uterus for accessory placental lobule, tumours, or ruptured uterus; massage of the uterus through the abdominal wall; and, if haemorrhage then continues, packing of the uterus. Appropriate transfusion measures are required. The authors discount the dangers of "pituitary shock" in the dosage which they have

employed. It is difficult to pick out from the tables the numbers of patients actually involved, while there is no mention of critical statistical analysis. The graphic figures are complicated, and not sufficiently detailed to repay the close study which they demand if they are to be intelligible. The paper indicates an aggressive attitude towards the management of the third stage which is unlikely to commend itself to the British practitioner. Nevertheless, the records of the Chicago Lying-in Hospital challenge comparison with any others, and it is clear that the incidence of postpartum haemorrhage has fallen to an extraordinarily low level (0.35 per cent in 1,159 cases during 1946). It is true that many British hospitals, with a conservative management, record figures almost as low (for example, Simpson Memorial Maternity Pavilion Reports show an incidence of 0.39 per cent over 9,533 deliveries in 1943-44-45), but these figures are not based upon such strict criteria as those applied in the Chicago study, and the magnitude of the authors' achievement should not be minimized. The omission of bimanual compression of the uterus in the treatment of postpartum haemorrhage is surprising, while the advocacy of the use of an intrauterine pack should have been tempered with warning of its dangers and reasons for its occasional failure to control bleeding in the completely atonic uterus.] W. I. C. Morris

1155. Method of Treating Massive Obstetric Hemorrhage.

By J. T. Cole. J. Amer. med. Ass., 135, 142-

144, Sept. 20, 1947. 6 figs., 4 refs.

This paper describes the method of blood replacement as practised at the Women's Clinic of the New York Hospital. In massive haemorrhage the basis of any successful treatment depends upon the rapid control of haemorrhage by the method causing least trauma, followed by restoration of the blood volume by the intravenous adminis-

tration of either blood or plasma, preferably the former. When blood loss is not checked quickly then haemorrhagic hypotension may progress rapidly to irreversible shock from which recovery is impossible. An effective plan of treatment is outlined. As a prophylactic measure typing of the blood of all pregnant women during the antenatal period is recommended. If for obstetrical reasons such as hydramnios, fibromyoma uteri, manual removal of the placenta, or difficult forceps delivery, haemorrhage can be anticipated, a preliminary cross-grouping should be carried out. A further safeguard, which the author now practises in Caesarean section, is to administer sixthmolar sodium lactate solution by the intravenous route at the time the operation is begun so that if the need arises blood can be substituted without delay. He now uses sixth-molar sodium lactate solution in preference to dextrose and isotonic solutions of sodium chloride in the belief that alkaline agents are useful in delaying the onset of irreversible shock until blood or plasma is available. Furthermore, alkalies will combat transfusion reactions.

By a series of graphs the author illustrates the importance of the time factor. From his studies he suggests a 40 per cent replacement of total blood loss during the first hour after the initial haemorrhage. Rapid treatment should not be stopped until there has been a definite response in the blood pressure. Thereafter blood should be given by the usual procedure until there has been 100 per cent or more replacement. The rapid replacement suggested is not possible by the drip method; consequently during the past 3 years the author had added a simple pressure mechanism to the ordinary transfusion apparatus. Two flasks containing citrated blood and sixth-molar sodium lactate solution respectively are connected by a Y-tube to a combined drip and filter chamber. To the air intake of the blood bottle a tube is attached, to which a Y-tube connects a sphygmomanometer bulb and an aneroid meter. Raising the pressure in the bottle of citrated blood to 120 mm. Hg enables 500 ml. of blood to be given quite rapidly (in 7 to 10 minutes with an 18-gauge needle and in 2 to 5 minutes with a 15-gauge

During the time these methods have been in use there have been no deaths in 7,500 major and minor gynaecological procedures; only I death was due to haemorrhage in 14,000 deliveries, included in which were 250 postpartum haemorrhages (600 ml. or more blood loss).

R. L. Hartley

1156. Haemorrhages in and after the Placental Stage of Labour, their Incidence and Prevention. (Blödningar under och efter efterbords-skiftet, deras frekvens och profylax.)

By H. SAURAMO. Nord. Med., 37, 399-403,

Feb. 27, 1948. 15 refs.

1157. Insuperable Postpartum Inertia Due to Haemorrhage into the Uterine Wall. (Consideraciones sobre inercia irreductible post parto por apoplejia uterina.)

By L. TISNE BROUSSE. Bol. Soc. chil. Obstet.

Ginec., 12, 246-252, Oct. 1947. I fig.

1158. Replacement of an Inverted Uterus with Intravaginal Packing.

By L. S. Loizeaux. Bull. N.Y. med. Coll., 10,

53-56, 1947. 1 ref.

1159. Uterine Inversion. (Inversion uterina.)

By J. Genato Muniz. An. Med. Cirug., 23, 81-85, Feb. 1948.

1160. Treatment of Complete Uterine Rupture during Labour. (Le traitement curatif des ruptures utérines complètes au cours du travail.)

By R. Merger, —. Hervé, and —. Lelièvre. Paris méd., 38, 129-132, Mar. 13, 1948.

1161. Shock in Obstetrics.

By W. A. Scott. Brit. med. J., 2, 647-649,

Oct. 25, 1947.

It is of little importance whether there is a special kind of shock, called "obstetric shock", occurring in normal women after normal labour. A number of maternal deaths were formerly attributed to this cause, but many authorities now believe that in the majority of cases, if not at all, necropsy will reveal some condition sufficient to account for the fatality.

Analysis of 82 maternal deaths in which there was clinical evidence of shock showed that in only II of the cases were there no definite lesions accounting for the shock; of these version was performed in 5, after failed-forceps. The author believes that from a clinical viewpoint most cases of obstetric shock can be evaluated in terms of haemorrhage. Other causes of shock may occur in parturient women, but they are relatively infrequent. Factors in development of shock include loss of blood, disturbed water balance with increased capillary permeability, hypertension due to toxaemia, mechanical trauma of delivery, and the lowering of intra-abdominal pressure with splanchnic vasodilatation which follows delivery. Obstetrical accidents which tend to lead to shock include haemorrhage from placenta praevia, and accidental or postpartum haemorrhage. Rupture of the uterus is probably more common than is recognized clinically. Inversion of the uterus causes rapid shock in most cases, though not in all. Vasomotor collapse may cause death in eclampsia. Some workers believe that emotional factors lead to shock, but this is doubtful.

In the management of these cases the question of concealed bleeding must always be borne in mind. Active treatment consists in allaying pain or apprehension with morphine, retaining body heat, and replacing the volume of circulating blood. Plasma may be used in small units at a distance from a blood bank. Operative procedures should

not be begun until measures to overcome shock, including intravenous therapy, have been initiated. The only exception to this rule is in cases where it is necessary to stop active haemorrhage. Transfusion should be started before operation is carried out in cases where haemorrhage is anticipated.

[This article only serves to emphasize the important part played by haemorrhage in maternal mortality and the importance of adequate supplies of blood in all obstetrical work. This includes not only blood banks in maternity units but "flying squad" facilities for domiciliary practice. One point omitted or overlooked by the author is the importance of Rhesus grouping in addition to ABO grouping and cross-matching before transfusion is carried out in parturient women, or indeed in all women who are potential mothers.]

Josephine Barnes

1162. A New Interpretation of Obstetric Shock. (Essais sur une nouvelle interprétation du choc obstétrical.)

By F. CISMIGUI. *Gynécologie*, 44, 247-264, Sept.-Oct., 1947. 37 refs.

### ANAESTHESIA.

1163. Anesthesia in Labor. (Panel Discussion.)
By J. S. GALANG. J. Philippine med. Ass., 34, 71-74, Feb. 1948. 3 refs.

1164. Anesthesia in Obstetrics. (Panel Discussion.) By A. Baens. J. Philippine med. Ass., 34, 67-70, Feb. 1948.

1165. Premedication and Anesthesia in Obstetrics: \_ Practical Aspects.

By B. B. Hershenson. *Anesthesiology*, 9, 73-85, Jan. 1948. 1 fig., 13 refs.

1166. Dilute Solution, Catheter, Continuous Spinal Analgesia for Labor and Delivery. A Preliminary Report.

By S. M. SHANE, D. F. KALTREIDER and H. M.-COHEN. Amer. J. Obstet. Gynec., 54, 488-495,

Sept. 1947. 3 figs., 4 refs.

The authors claim to have overcome the complications of continuous caudal analgesia and spinal analgesia by injecting into the subarachnoid space through a ureteric catheter an anaesthetic solution (0.05 per cent "pontocaine" (amethocaine) in roper cent glucose) so dilute that no somatic sensory loss and little or no motor paralysis was produced, but the pain of uterine contractions was abolished.

"Methedrine", 0.5 ml., is given and a 16-gauge special directional spinal needle is inserted between the third and fourth lumbar vertebrae into the subarachnoid space, and turned so that its aperture is directed cranially. The catheter is then inserted through the needle until its tip lies about 1 in. (2.5 cm.) beyond the needle point at the lower border of the second lumbar vertebra. It must not be

withdrawn after this, because the sharp edge of the needle might sever it. The needle is gently withdrawn from the body. The catheter is then bent over a roll of gauze and attached with adhesive to the back. The patient is turned on her back with her head raised, and the first injection of 1 ml. of solution (0.5 mg. of pontocaine) is made rapidly so that the solution rises to the region of the eleventh and twelfth thoracic nerves. It does not affect the motor sympathetic nerves to the uterus leaving the fifth and sixth segments, because it is too dilute at this level. This dose may be repeated hourly. It relieves pain due to uterine contractions, but there is still some pain in the back and thighs, due, according to the authors, to progressive cervical dilatation. At full dilatation, in order to relieve this remaining pain, 2 to 3 ml. is injected with the patient half sitting. "Bearing-down" efforts are still possible. Immediately before delivery 4 mg. pontocaine in 2 ml. of 10 per cent glucose is injected during 2 minutes with the patient in the reverse Trendelenburg position, which is maintained for a further minute after the injection. This produces complete relief from pain and relaxation for 11/2 to 2 hours. Analgesia is begun in primigravidae at 6 to 7 cm. dilatation and in multigravidae at 3 to 5 cm.; the presenting part must be at least on a level with the ischial spines. The contra-indications given by the authors are contracted pelvis, bleeding, syphilis, tumours of the central nervous system, skin infection at the site of injection, and a floating foetal head.

A table of results in 43 cases is given. There were no maternal or foetal deaths, failures, or complications, apart from headaches not worse than those after spinal analgesia. Labour was not delayed; there was minimal blood loss and babies did not require resuscitation. It is stated that the need for "operative or midforceps interference" was not increased; the table shows that forceps were applied at the outlet in 25 cases, and at the mid-plane in 2 cases, while rotation and forceps delivery was performed in 7 cases; these cases were not, however, associated with prolongation of the second stage.

[The average duration of analgesia in these patients was only 4½ hours, and although the authors' extreme care and attention to detail allowed no complications in this series, the abstracter feels that relief of pain in the last 4½ hours of labour should be possible by less elaborate and potentially dangerous means.]

Āileen Dickins

1167. Continuous Caudal Analgesia in Obstetrics, Surgery and Therapeutics.

By R. A. Hingson, Curr. Res. Anesth., 26,

177-191, Sept.-Oct., 1947. 14 figs.

This is a very detailed analysis of the results in a series of deliveries conducted under continuous caudal analgesia.

The maternal mortality rate is stated to be

lower in the caudal series than in a control series -7.9 per 10,000 deliveries against 19.3 per 10,000. Pain was satisfactorily relieved in 95 per cent of cases. When the labour is expected to be a long one, 0.15 per cent "pontocaine" is used with the ureteric catheter technique; when a short labour is anticipated, 1.5 per cent metycaine is given with a malleable needle. Analgesia is not started until the cervix is 5 cm. dilated in primiparae and 3 cm. in multiparae. Of the control series, 31 per cent were delivered spontaneously, against only 15.5 per cent of the "caudal" series. Maternal morbidity in the "caudal" series was 7.4 per cent, in the controls 10.8 per cent. After caudal analgesia 16.7 per cent required catheterization and of the controls 14.1 per cent.

Respiration of the infant was delayed in 3:6 per cent of the "caudal" series and 9.6 per cent of the controls. The still-birth rate was 9.1 per 1,000 live births against 24.8 per 1,000 in the controls; neonatal mortality was 11.5 per 1,000 live births against 20.8 per 1,000 live births in the controls. With premature infants the neonatal mortality rate was 169 per 1,000 live births as against 294 in the control group.

Other reported uses for caudal block are for Caesarean section, vaginal hysterectomy, hernioplasty, and operations on the perineal region, and for the relief of pain in burns and traumatic injuries of the lower limbs. It has been employed in the diagnosis and treatment of essential hypertension and in the treatment of eclampsia and of uraemic convulsions. Other possible uses are in diabetic gangrene, Buerger's disease, Raynaud's disease, arteriosclerotic gangrene, immersion and trench foot, atrophic ulcerations of the lower limbs, and thrombophlebitis.

[So detailed is this analysis that at times it becomes confusing, and the way in which the author has arrived at some of the figures is occasionally by no means clear. Moreover, some of the conclusions drawn must be regarded as somewhat speculative. Nevertheless caudal block has great possibilities, and it is a pity it has not had a more extensive trial in Britain.] G. C. Steel

1168. Postpartum Headache after Low Spinal Anesthesia in Vaginal Delivery and its Treatment.

By F. Weintraub, W. Antine, and A. J. Raphael. Amer. J. Obstet. Gynec., 54, 682-686,

Oct. 1947. 6 refs.

Low spinal analgesia in obstetrics gave rise to a 15 per cent incidence of postpartum headaches in a series investigated by the authors during and after delivery. They conclude that two factors are particularly responsible for these headaches—the sudden release of intra-abdominal pressure superimposed on the action of the anaesthetic, and the spinal fluid leakage. The former results in a pooling of blood in the splanchnic vessels augmented by vasomotor paralysis due to the action of the spinal analgesic on the sympathetic nerves.

To compensate this, abdominal compression by means of an abdominal binder proved efficacious in the majority of cases, and the authors make use of the old remedy of applying a sandbag to the abdomen immediately after delivery as a To avoid spinal fluid prophylactic measure. leakage fine-gauge needles must be used. The inadequacy of the various drugs advocated is E. D. Grasby

1169. New Horizons in Therapeutic Nerve Block in the Treatment of Vascular and Renal Emergencies with Continuous Caudal and Continuous Spinal Analgesia and Anesthesia.

By R. Hingson, F. E. Whitacre, J. G. Hughes, H. B. TURNER, and J. M. BARNETT. Sth. Surg., 13, 580-609, Aug. 1947. 22 figs., 15 refs.

Conduction anaesthesia was first practised 50 years after the discovery of inhalation anaesthesia. It is segmental and eliminates pain at its source instead of blunting its central interpretation. When pain is obliterated by anaesthesia the functions of many tissues are altered; a study of these alterations may be of use in treatment. Therapeutic nerve block depends on the fact that the pain and vasomotor fibres are blocked earlier, more fully, and longer than the motor fibres.

"Experience with 15,000 patients under spinal, caudal, paravertebral, presacral, peridural, and sympathetic ganglion anaesthesia, clearly convinces one of the cardinal role that is played by the peripheral vascular bed when it is subject to temporary conduction denervation. No one can watch a hypertensive, eclamptic, comatose, convulsant patient, in acute heart failure and pulmonary oedema, rescued within 30 minutes by a therapeutic continuous caudal or continuous spinal anaesthesia-which frequently lowers the blood pressure 100 mm. of mercury, and simultaneously relieves headache and blurred vision, raises the skin temperature of the feet 30° F., diminishes near-fatal pulmonary oedema, slows and steadies the failing heart, increases renal output and coincidentally abolishes pain-without appreciating that in this mechanism lies one of the most potent weapons the physician possesses to wage against disease and death."

Spinal and continuous caudal analgesia are strongly recommended for the obstetric patient, handicapped by disease. Since 1943, the authors have used these methods in 85 labours in women with cardiac disease; there have been no maternal deaths. Spinal analgesia, by pooling blood at the periphery, dilating veins, and decreasing venous pressure, can be regarded as a bloodless phlebotomy, useful in heart failure and pulmonary oedema. By this method the venous pressure can be lowered without any loss of haemoglobin. When the effects of a single dose of a spinal analgesic have worn off, the symptoms-high blood pressure,

paralytic ileus-may return. This indicates the need for a continuous, controlled application of the block for as long a time as may be necessary.

A case of eclampsia with severe heart failure and pulmonary oedema is described. The patient was moribund; oxygen failed to relieve the cyanosis and digitalis intravenously did not relieve the heart failure. There was improvement immediately after the administration of continuous caudal analgesia with "metycaine". When this was discontinued after 5 hours the symptoms recurred until the block was resumed. The patient then had a copious haemorrhage from a placenta praevia. A Caesarean section was performed and caudal analgesia continued for the next 20 hours The level of analgesia then fell and could not be maintained. Again the symptoms came back, so continuous spinal "pontocaine" (amethocaine) was given for 48 hours, after which it was discontinued, all symptoms having subsided. Four very severe cases of acute nephritis in children were treated in this way; 2 patients recovered. authors also describe a case of acute nephritis, which probably provides a record for duration of spinal analgesia; the latter was maintained continuously for 10 days and 6 hours, during which time a critical hypertension was reduced 114 times. The acute nephritis with anuria followed cavernous sinus thrombosis. Seventeen cases of vascular and renal emergencies are tabulated; 9 of the patients recovered. The treatment was also given in 18 cases of eclampsia; there were 2 deaths in this W. Stanley Sykes group.

1170. Amidone (Miadone) as an Obstetric Analgesic. Trial in 62 Cases.

By F. PRESCOTT and S. G. RANSOM. Lancet, 2,

501-503, Oct. 4, 1947. 6 refs.
A clinical trial of "physeptone" ("amidone" or "miadone") as an obstetric analgesic in 62 cases is described. The drug was prepared synthetically in Germany during the war, and, although unrelated to morphine, it has many of the pharmacological properties of the latter. As an analgesic it is as potent as morphine and ten times as potent as pethidine. It is less toxic than pethidine and equally effective as a spasmolytic. As a respiratory depressant physeptone was initially less powerful than pethidine; but the effect lasted much longer, with the result that over a period of 3 hours it produced a greater depression of respiration than pethidine.

In the clinical trial conducted by the authors physeptone was given to 62 primigravidae in labour; to a control series of 85 pethidine was administered. The investigation was discontinued because although the drug was as effective as pethidine in relieving the pain of labour, it was much more depressant to the foetus. This was particularly noted when it had been administered over 4 hours before delivery. J. Stallworthy

1171. Intravenous Drip Infusion of Procaine in Labour. (L'analgesia endovena a goccia con Recorcaina in travaglio di parto.)

By A. RIZZUTI and F. OLIVELLI. Ginecologia,

Torino, 14, 32–42, Jan. 1948. 1 ref.

1172. Demerol and Scopolamine in Obstetrics.

By G. Rustia and L. Almeda. J. Philippine med. Ass., 34, 61-65, Feb. 1948. 6 refs.

1173. Trilene as an Analgesic in Labour. (Použití trilenu k tišení porodních bolestí.)

By M. STEINER. Ceshoslov. Gynaek., 13, 151-157, 1948.

1174. Epidural Analgesia in Obstetrics. (Nuestra experiencia sobre la anestesia peridural en ginecologia.)

By P. CAPELL MARTINEZ. Med. esp., 19, 26-35, Jan. 1948. Bibliography.

1175. Nitrous Oxide Analgesia in Labour. (Použití kvsličníku dusného k tišeni bolestí pri porodu.)

By J. Jerie and A. Pechar. Ceskoslov. Gynaeh., 13, 142-150, 1948. 2 figs.

# PUERPERIUM.

1176. Early Ambulation after Labour or Abortion. (Théorie et pratique du lever précoce après l'accouchement ou l'avortement par voie vaginale.)

By J. Kreis. Rev. franç. Gynéc., 43, 45-56,

Feb. 1948.

1177. Late Haemorrhage in the Puerperium (Without Retention). (Sobre hemorrhagias tardias del puerperio (sin retención).)

By J. F. Popelaire. Bol. Soc. chil. Obstet. Ginec., 12, 170-185, Aug. 1947. 2 figs., 5 refs.

1178. Necrosis of a Fibroid During Puerperium. (Martwica miesniaka w przebiegu pologu.)

By J. Sieroszewski. *Polsk. Tyg. lek.*, **2**, 1093-1094, Sept. 1947. 13 refs.

1179. Essential Thrombocytopenic Purpura and the Puerperium. (Sobre enfermedad de Werlhof y estado puerperal.)

By H. DEL VALLE and O. TRIVELLI. Bol. Soc. chil. Obstet. Ginec., 12, 253-262, Oct. 1947.

1180. Magnesium Sulphate in the Treatment of Puerperal Infections. [In Russian.]

By L. I. Bublichenko. Akush. Ginec., No. 2,

11-13, 1947.

The effect of intramuscular injection of magnesium sulphate on pelvic sepsis has been studied in 100 cases of puerperal infection. The dose administered was 10 ml, of a 25 per cent solution, 38 patients receiving only one injection, 29 two injections, 16 patients three injections, 12 patients four injections, and 5 five injections. When the treatment began 4 patients had a temperature below 38° C.; 36 patients had a temperature of

38° to 39° C.; 39 patients had a temperature of 39° to 40° C.; and 21 a temperature of over 40° C. In all cases pain rapidly disappeared as a result of the injection. The temperature subsided in 72 cases. The swelling diminished, and later disappeared completely. The author concludes that this is a valuable drug in pelvic inflammatory conditions.

Nicolas Tereshchenko

1181. Recognition and Treatment of Puerperal Pyrexia. (Erkennung und Behandlung des Puerperalfiebers.)

By W. Schultz. Z. Geburtsh. Gynäk., 129, 22-45, 1948. 6 figs., Bibliography.

1182. The History of Semmelweis's Teaching. (Zur Geschichte der Semmelweisschen Lehre.)

By E. F. Podach. Z. Geburtsh. Gynäk., 129, 59-69, 1948. 12 refs.

1183. Influence of Recent Coitus on the Vaginal Flora and on Puerperal Infection. [In Russian.]

By P. Kostic. Srpski Arkhiv, 46, 30-40, Jan. 1948. 14 refs.

1184. Penicillin in Infections Associated with Labour, the Puerperium, and Abortion. (La penicilina en los procesos sépticos del parto, del puerperio y del aborto.)

By V. Beato and C. Padilla. Toko-ginec. prat.,

7, 94-112, Mar. 1948. 31 refs.

1185. Penicillin and Sulphonamide Therapy of Puerperal Infections. (Penicilinoterapia y sulfamidoterapia en infecciones puerperales.)

By H. Mujica Lorga and O. Trivelli Rocchi. Bol. Soc. chil. Obstet. Ginec., 12, 189-212, Sept.

1947. 3 figs.

1186. B. Coli Meningitis in the Puerperal State. Report of Two Cases.

By K. J. McMorrow and F. H. Top. J. Michigan med. Soc., 47, 62-63, Jan. 1948. 6 refs.

# LACTATION.

1187. Hormones and Lactation. Dried Thyroid Gland.

By M. Robinson. Lancet, 2, 385-387, Sept. 13,

1947. 5 refs.

An investigation was made of the relation between thyroid administration and lactation, 500 untreated lactating mothers being used as controls and observed for the first 6 months. A flow of 10 oz. (284 ml.) milk by the fifth day or 16 oz. (452 ml.) by the tenth day of the purperium was usually a sign of an established lactation, and mothers whose lactation failed before the sixth month usually had not come up to this standard. In 332 cases of failure to establish lactation a detailed study was carried out of dried thyroid, crude anterior pituitary, thy-

roxine, iodine, and injections of physiological saline. Treatment lasted only from the seventh until the twelfth day of the puerperium, further treatment being found to give no better results. Up to gr. 12 (0.78 g.) of thyroid daily was administered, in order to break down resistance with no apparent harmful results. The results with the pituitary preparation were no better than the results in those patients receiving injections of saline or no treatment at all; thyroid alone gave as good results as did a combination of thyroid and anterior pituitary. With thyroxine there was an increase in milk yield similar to that obtained with the larger doses of thyroid extract, but the size of the dose did not affect the results. With large doses of thyroid (gr. 9 to 12 (0.6 to o.8 g.)), the milk yield was increased by more than 100 per cent.

In all patients receiving iodine there was an increase in breast milk.

Beryl Twyman

1188. The Biological Activators of Lactation. (Gli attivatori biologici della secrezione lattea.)

By I. MASTRONARDI. Ginecologia, Torino, 14, 43-47, Jan. 1948. 7 refs.

1189. Failure of Lactogenic Hormone to Maintain Pregnancy Involution of the Thymus.

By C. Grégoire. J. Endrocrinol, 5, 115-120,

July 1947. 6 figs., 3 refs.

An attempt was made to determine whether lactogenic hormone is responsible for the maintenance of pregnancy involution of the thymus during normal suckling. Primiparous female albino rats 6 to 7 months old were spayed immediately after removal of their litters at birth. Twenty received daily subcutaneous injections for 10 days of 0.3 ml. pituitary lactogenic hormone (10 Riddle units per mg.) dissolved in sodium hydroxide solution to a strength of 20 mg. per ml. and adjusted to pH 10.0; 17 control rats were similarly injected with the solvent. The rats were killed on the eleventh day. Organ weights were calculated as grammes per kilo body weight.

There was no histological difference in the thymus glands of the two groups or in the weight. The difference in weight of the adrenals and of the thyroid glands was not significant (P=0.2). Histologically, the thyroid glands of both groups were inactive, but the epithelial height in the follicles of the injected group was significantly lower than in the controls (12.3+0.21 mm., and 13.6±0.3 mm.). The differences in weight of spleen (injected 2.64 ±0.12; control 2.33 ±0.1) and of lymph nodes of the subscapulary and axillary groups (injected 0.757 ±0.039; control 0.535 ±0.021) and of the inguinal group (injected 0.365 ± 0.024; control 0.299 ± 0.015) were significant. [No value for P is given.] There was no difference in the weight of the lymph nodes of the iliac group (injected 0.159; control 0.168). The mammary glands of the injected rats showed less involution

than those of the controls, although considerable variation occurred in different parts of the same gland as well as in different glands of the same animal. The milk ducts of the injected rats were distended with secretion.

No relation between retarded mammary involution and weight of thymus gland could be shown, but there was a possible relation between retarded mammary involution and hypertrophy of the lymph nodes and thyroid epithelial height. The author concludes that the maintenance of pregnancy involution of the thymus glands during normal suckling is not due to the action of lactogenic hormone. He suggests that hypertrophy of the superficial lymph nodes is a reaction to increased activity of the mammary glands, and thyroid inactivity is a result of a change in thyrotrophic hormone secretion following milk retention.

S. A. Simpson

1190. Metabolism of Women During the Reproductive Cycle. XIV. The Utilization of Pantothenic Acid During Lactation.

By M. N. CORYELL, M. E. HARRIS, S. MILLER, H. H. WILLIAMS, and I. G. MACY. J. Lab. clin.

Med., 32, 1454-1461, Dec. 1947. 28 refs.

The patients in these studies were multiparous women, selected during the first 3 months of pregnancy, who had successfully nursed other children. Seven of them were studied during the first 10 days after delivery, and 5 of these, with 4 others, were studied during seventeen 5-day periods while they were producing mature milk. Mixed samples of the food and the total daily output of milk and urine were analyzed for pantothenic acid by a microbiological method. The average daily intake of pantothenic acid was between 6 and 9.5 mg. The output in the milk gradually increased during the ro days after delivery in proportion to the increase in volume. The total output in milk and urine was on the average rather less than the intake during the first 5 days and rather more during the next 5 days. During the periods of mature milk production there was no relation between the intake, the secretion in the milk, and the excretion in the urine. The excretion in the urine was 32 to 89 per cent of the intake, and the total content in urine and milk was 63 to 103 per cent of the intake. J. Yudkin

1191. Metabolism of Women During the Reproductive Cycle. XV. The Utilization of Biotin During Lactation.

By M. N. CORYLL, M. E. HARRIS, S. MILLER, M. M. RUTLEDGE, H. H. WILLIAMS and I. G. MACY. J. Lab. clin. Med., 32, 1462-1469, Dec. 1947. 22 refs.

Biotin was estimated in the same specimens of food, milk and urine as those examined in the previous study (Abstract 1190). The daily intake was 42 to 70  $\mu$ g. free biotin (average 56  $\mu$ g.) and 52 to 117  $\mu$ g. total biotin (average 81  $\mu$ g.). The

output in the milk was too low to be measured during the first few days after delivery; from the fifth to the tenth days it increased rapidly but varied greatly in the different subjects (0.24  $\mu$ g. to 25.17  $\mu$ g. daily). In the mature milk the daily output was 0.9 to 10.8  $\mu$ g. The urine contained 8 to 54  $\mu$ g. daily.

J. Yudhin

1192. Metabolism of Women During the Reproductive Cycle. XVI. The Effect of Multivitamin Supplements on the Secretion of Vitamin A in Human Milk.

By M. LESHER, A. ROBINSON, J. K. BRODY, H. H. WILLIAMS, and I. G. MACY. J. Amer. dietet. Ass. 24, 12-16, Jan. 1948. 34 refs.

By W. G. LEARY. California Med., 68, 147-151, Mar. 1948. 13 refs.

## THE INFANT.

1194. The Titratable Acidity, pH, Ammonia and Phosphates in the Urines of Very Young Infants.

By R. A. McCance and M. A. von Finck. *Arch. Dis. Childh.*, **22**, 200–209, Dec. 1947. 5 figs., 45 refs.

For some time after birth the kidney function is still immature, and it has been shown that the glomerular filtration rate, and the urea, sodium, and chloride clearances are low in newborn babies. This paper extends these observations by furnishing data on the pH, the titratable acidity, the ammonia coefficients, and the phosphate in the urine of newborn babies born in occupied Germany. Comparisons are made with specimens obtained from healthy British in Germany.

The data are based on the examination of urine from 72 infants, 36 adults, and 10 diabetics. All the babies were breast-fed and no additional water was given. The following results were obtained: (1) The average pH tended to fall slightly after birth with an increase as milk flow was established. The pH did not differ from the average in urine from healthy adults. (2) The titratable acidity varied with the concentration of the urine and fell as the pH rose. (3) Ammonia coefficients were unaffected by the age of the baby, but on the average were higher than in normal adults. (4) The ratio of the ammonia to the acidity was higher in infants than in adults. (5) Urine of newborn infants contained very little phosphate. This might lead to an incapacity to deal with an acidosis, should one occur. (6) Urine passed in utero was very dilute but differed in no other way from that passed in the first few days of life. A. G. Watkins

1195. Asphyxia of the Newborn. (Asfixia del recién nacido.)

By R. GANTES. Rev. chil. Pediat., 18, 715-732, Oct., 1947. 7 refs.

1196. Chronic Encephalopathy and Obstetric Trauma. (Encéphalopathies chroniques et traumatismes obstétricaux.)

By —. ROUDINESCO, M. R. KLEIN and M. NICOLLE. Sem. Hôp., Paris, 23, 2290-2296, Oct. 14, 1947. 6 figs., 1 ref.

A series of 524 cases of chronic encephalopathy in children is reviewed in order to determine the incidence of obstetric trauma. Their classification and relative frequency are given as follows: intellectual retardation, 68.51 per cent; psychomotor retardation, 6.87 per cent; epilepsy, 13.5 per cent; various motor disorders, 7.25 per cent; microcephaly, 3.28 per cent; hydrocephalus, 0.76 per cent. The series contains very few cases of Little's disease, which is diagnosed only in children showing spasticity and a typical position of the limbs on being held up and is not taken to include paralysis, pyramidal-type contractures and reflex changes, convulsions, or mental deficiency.

No traumatic cause was found responsible in the cases of pure intellectual retardation. With associated motor disturbances, however, 4 of the 36 cases in the series could be regarded as the result of obstetric trauma. Eight out of the 70 cases of epilepsy were attributed to birth injury as their symptoms began within 18 months of a difficult birth. Of the various motor disturbances 21 (55.26 per cent) were considered to be due to obstetric trauma, 13 of these being hemiplegias (70 per cent of those reviewed). Six cases of hemiplegia are described in detail, and it is demonstrated from the histories, symptoms, and results of encephalography, ventriculography, or surgical exploration that three types can be differentiated. Type I hemiplegia is associated with generalized encephalography; the cortex is atrophied with compensatory ventricular dilatation, mainly on the side corresponding to the hemiplegia. Type 2 hemiplegia is characterized by adhesions between cortex and meninges with or without arachnoid cyst formation; surgical treatment is often successful. Type 3 shows progressive hemiplegia, often with convulsions, and here formation of adhesions or cysts is complicated by a spreading meningeal reaction; surgical intervention should not be delayed. Amongst the other types of motor disturbance the connection with birth injury was less clear. Criteria for attributing microcephaly to obstetric trauma were a history of difficult birth, convulsions, and early fusion of skull bones (secondary to diffuse cerebral sclerosis). Few cases of hydrocephalus were attributed to birth injury, since the condition started in the third or fourth month of life and was preceded by convulsions.

The authors regret that they have been unable to review a series of infants subjected to obstetric trauma and to follow them up to establish the incidence of motor and intellectual consequence.

H. Herlinger

1197. A Case of Dicephalic Monstrosity Delivered Without Medical Aid.

By L. W. Alderman. Med. J. Aust., 1. 531-532, Apr. 24, 1948. 1 fig., 2 refs.

1108. Recurrent Chronic Subdural Hematoma in an Infant. Case Report.

By A. KAPLAN. J. Mt Smai Hosp., 14, 418-423,

Sept.-Oct. 1947. 3 figs., 7 refs.

The anthor reports an unusual case of chronic subdural haematoma, originally bilateral, which recurred on one side after operation, with formation of a large cyst between the scalp and the bone flap, which had been raised at the previous exploration. The membrane forming this cyst was continuous through a defect in the dura with that of the underlying chronic subdural haematoma. Complete removal of this membrane resulted in cure, and the importance of this feature is stressed.

A brief review of the literature on chronic subdural haematoma is included, and points in the diagnosis are discussed. The importance of making the diagnosis early is obvious, since operative treatment can prevent permanent cerebral damage. "Any infant who has been progressing normally up to the age of 4 or 5 months and then begins to have periods of lethargy, convulsions, vomiting, restlessness, and disproportionate enlargement of the head should be suspected of a chronic subdural haematoma." The diagnosis can be established by the simple procedure of tapping the subdural spaces through the lateral angles of the anterior fontanelle.

M. Baber

1199. Response of New-born Children to Hypertonic Solutions of Sodium Chloride and of Urea.

By R. F. A. DEAN and R. A. McCance. *Nature*, *Lond.*, 160, 904, Dec. 27, 1947. I fig., 3 refs.

The authors examined the diuresis following injection of hypertonic saline and urea in infants suffering from meningomyelocele, and comp.red the findings with those in normal adults. While a diuresis occurred in both infants and adults, this was much less marked on a basis of surface area in infants, while after saline the osmotic pressure of the urine behaved differently in the two groups, falling in adults and rising in infants. Excretion of administered salt was strikingly slower in infants. Somewhat similar results were obtained with urea, though the discrepancies between age groups were less marked and the diuresis less.

Alex. Comfort

1200. The Problem of Prematurity.

By G. B. WISWELL. Nova Scotia med. Bull., 27, 33-43, Feb. 1948.

1201. The Prognosis of Prematurity in a Children's Hospital Compared with that in 4 Non-pediatric Hospitals. (Praematurers prognose paa en børneafdeling og paa 4 ikke-børneafdelinger.)

By I. BOESEN. *Nord. Med.*, **37**, 418-421, Feb. 27, 1948. 3 refs.

1202. Experimental Use of Testosterone Compounds in Premature Infants.

By E. K. SHELTON, A. E. VARDEN, and J. S. MARK. J. clin. Endocrinol., 7, 708-713, Oct. 1947. 12 refs.

The authors describe the results of treatment of 74 premature infants, weighing under 2 kg. at birth, with testosterone compounds. The infants were divided into three groups: a control group of 20; a group of 30 infants who received methyl testosterone; and a group of 24 who received testosterone propionate. They were further divided in two groups according to birth weight, the first group weighing 1 to 1.5 kg. at birth and the second 1.5 to 2 kg. Progress was assessed by the time taken to regain birth weight and to reach 2.5 kg.

Methyl testosterone was given in doses of 5 mg. daily in propylene glycol, and was placed direct on the tongue immediately before oral feeding or gavage. Testosterone propionate was given intramuscularly into the gluteal region in a dose of 4 mg. daily. No toxic effects were noted. There was no abnormal hair growth or enlargement of the genitalia in either sex. In all groups the babies treated with testosterone showed a significant shortening of the time required to regain birth weight and to reach 2.5 kg. Particularly significant are the observations on four sets of twins, where one sibling was used as a control in each case. Some of the initial gain may be due to water and salt retention, but no sharp loss of weight occurred when testosterone was withdrawn. The effect of testosterone is to cause retention of nitrogen, resulting in building of tissues, growth, and muscle hypertrophy. There is also water, sodium, potassium, and chloride retention. It has been suggested that premature closing of the epiphyses may occur, with resultant stunting of growth. The infants in the present series were. examined by serial radiographs of the wrists and ankles for the first year of life. No difference was found between the treated series and the controls.

The authors do not advocate the routine use of testosterone for all premature infants, but suggest that it may be useful in selected cases needing metabolic stimulation.

Josephine Barnes

1203. The Treatment of Certain Serious Infections in the Newly-born Infant.

By P. J. WHITE. Nebraska St. med. J., 33, 13-17, Jan. 1948. 16 refs.

1204. Oral Penicillin in Infants.

By G. S. Husson. J. Pediat., 31, 651-657, Dec.

1947. I fig., 23 refs.

This investigation was undertaken to discover the degree of alimentary absorption and the concentrations in the blood of penicillin administered orally. A daily dose of 20,000 units of penicillin dissolved in 5 to 10 ml. water was given to healthy babies 1 week to 5 months old immediately before their milk feed. Serum levels of penicillin were

estimated at varying intervals after the feed, but especially at the end of the first and third hours. In all, 22 estimations were made. An adequate therapeutic level of penicillin was considered to be 0.06 unit or over per ml. This serum level was obtained in all cases up to 3 hours after injection. Gastric acidity is less of an obstacle to absorption of oral penicillin in an infant than in an older child or an adult. After a high gastric acidity in the first 24 hours of life there is a decline until the tenth day, which is followed by a gradual increase to adult level at the age of 3 years. Not only is there a low gastric acidity but also the relative inefficiency of the infant's kidney tends to delay penicillin excretion. A third factor favourable to penicillin retention in infants is that there are fewer penicillinase-producing organisms in the intestinal tract. The author concludes that oral penicillin is a safe and practical way of treating infection in penicillin-sensitive due to ordinary A. G. Watkins organisms.

1205. Febrile Convulsions: A Clinical Study with Special Reference to Heredity and Prognosis.

By S. LIVINGSTON, E. M. BRIDGE, and L. KAJDI. J. Pediat., 31, 509-512, Nov. 1947. 11 refs.

The literature of convulsions in infancy is reviewed. Because the type most generally seen in infants is the febrile convulsion, children whose first convulsion had been associated with acute febrile illness were studied. The 94 children in this series had had such frequent convulsions that they were considered to be epileptic.

They were divided into two groups: (1) those in whom the initial and subsequent convulsions were accompanied by fever; (2) those in whom the inital and some of the ensuing convulsions were febrile. All the children in the first group and 37 per cent in the second group recovered, in the sense that 2 years elapsed without a convulsion. By a different grouping of the patients the prognosis in different types of convulsion was estimated. Of those who had generalized convulsions only, 36 (64 per cent) recovered, but those with occasional evidence of a focal lesion, 10 (26 per cent) recovered. recovery rate was higher in those who had fewer recurrences of the convulsions. The prognosis was less favourable if close relatives had suffered from chronic epilepsy, and also if the history showed no incidence of convulsive disorders. There would seem to be, therefore, a significant difference in the hereditary factors which predispose to epilepsy and those predisposing to childhood convulsions. This suggests that, in the absence of a hereditary predisposition, the convulsion is more likely to be due to organic brain damage. Race, sex, age at onset, and treatment did not influence the prognosis. B. S. P. Gurney

1206. Contagious Eruptive Fever with Unusual Symptoms in Infancy. Report of 12 Cases. [In English.]

By 'S. ZIMANYI. *Paediat. danub.*, 2, 208-215, Oct. 1947. 9 refs.

In February and March 1947, 12 infants aged from 7 to 24 months developed an acute febrile illness with unusual features. Ten cases occurred in out-patients, from widely distributed homes, of a maternity and child welfare clinic in Budapest, and 2 were seen in private practice. There was no contact outside the waiting-rooms, and it seems that the first infant observed (aged 7 months) infected 4 others [in the waiting-room?], and these in turn conveyed the disease to 4 more, the latent intervals being in both instances 5 days, presumably the incubation period of the disease. In all. the attack began suddenly without prodromata, and physical signs were limited to pyrexia (104°F.; 40°C.) and the simultaneous appearance of a rash of scarlatiniform type which was most profuse upon the extensor surfaces of the limbs but also invaded the palms, soles, and face. The chest and abdomen were not involved. The erythema, which was not punctate, was slightly raised and "appeared to have a special predilection for the follicles". The colour of the rash was "less reddish" than that of scarlet fever. On the second and third day of the erythema, petechiae were noted at the sites already invaded. High pyrexia was maintained until the fourth or fifth day and then began to subside, the temperature reaching normal by the sixth or seventh day. Concurrently, the rash faded, and by the seventh to tenth day was hardly perceptible. "Branny" desquamation of the areas of skin invaded followed.

During the first few hours of the illness the general condition of the patients seemed unaffected, but with the appearance of petechiae they became "very ill" [the text suggests toxaemia]. In all cases the tongue was clean; there was no diarrhoea; the buccal and pharyngeal mucous membranes were normal; and there was no enlargement of the lymph nodes. Blood counts in 5 cases were similar; erythrocytes normal; white cells 9,600 to 11,000 per c.mm.; neutrophils 35 to 40 per cent, lymphocytes 48 to 52 per cent, mononuclears 2 to 3 per cent, and immature cells 5 to 8 per cent. The platelet count was reduced (70,000 to 10,000) and bleeding time prolonged (3 to 4 minutes). Erythrocyte sedimentation rate was 60 to 70 mm. [presumably Westergren's method was used]. Repetition of the red and white cell counts a few days later revealed no change, but the platelet counts were then normal and the bleeding time had decreased by half. The author was able to exclude scarlet fever, measles, rubella, exanthema subitum [roseola infantum of Zahorsky], erythema infectiosum, erythema multiforme, influenza, and drug rashes; he believes that his cases differed essentially from the febrile exanthemata hitherto recorded.

[The blood picture is not inconsistent with a virus infection. Purpura haemorrhagica, it is

interesting to note, has been recorded in association with thrombocytopenia and prolonged bleeding time by Piten and by Gunn in 2 cases of rubella. In both, purpura appeared after the rash had faded.]

E. H. R. Harries

1207. A New Treatment for Diaper Rash. Pre-liminary Report.

By R. A. Benson, L. B. Slobody, L. Lillick, A. Mafria, and N. Sullivan. J. Pediat., 31, 369

374, Oct. 1947. I fig., 4 refs.

Mercury perchloride, I in 4,000, has long been used as a rinse for infants' napkins when it is desired to eliminate the urea-splitting organisms which are the cause of ammonia dermatitis. A new organic chemical "diapene" (a quarternary ammonium compound p-dissobutylcresoxyethoxyethyldimethylbenzyl ammonium chloride monohydrate) has been introduced, and this study shows that it is as effective a germicide as mercury perchloride for this purpose, and has the advantage of being less poisonous. The ammonia dermatitis in 49 out of 50 infants was cleared within I week when the napkins were rinsed in I in 25,000 diapene.

D. Gaurdner

1208. Staphylococcal Pneumonia in Childhood. Pathological Considerations.

By K. J. GUTHRIE and G. L. MONTGOMERY. Lancet, 2, 752-755, Nov. 22, 1947. 30 refs.

This paper is concerned with 55 cases of staphylococcal pneumonia coming to necropsy at the Royal Hospital for Sick Children, Glasgow, in the decade 1936-45, and a further 16 occurring during an outbreak of staphylococcal infection at a maternity nursery. Two-thirds of the first group of patients were under 6 months of age. The lungs of those who died in the early stages showed macroscopically a red haemorrhagic pneumonia, diffuse and localized. In the later stages there was a diffuse, greyish change, with local suppurative softening and sometimes frank abscess formation. Suppurative bronchitis or bronchiolitis was often present and empyema occurred in a little under 50 per-cent; pyopneumothorax was seen once only. [This complication is said to be not uncommon in staphylococcal pneumonia in infants.] scopically, in the early stages foci in which the alveoli were stuffed with red cells were surrounded by zones containing oedema fluid. In the later stages small abscesses were separated by oedematous or haemorrhagic lung tissue. From the lungs pure cultures of deeply pigmented, non-haemolytic staphylococci were obtained, which, in the cases in which they were tested, were coagulase-positive and penicillin-sensitive. The disease was often rapidly fatal, sometimes within 48 hours of onset. Severe dyspnoea was often the first symptom; less frequently the disease began with cough, vomiting, or rigour. In small children sputum is not usually obtainable and throat swabs and lung punctures were found to be unreliable. Presumably it is for

this reason that no mortality rates are given.] With this difficulty in bacteriological diagnosis the authors recommend immediate administration of penicillin in all cases of severe pneumonia in children. They find that staphylococcal pneumonia has become commoner in recent years as shown both by necropsy studies and by the increased proportion of staphylococcal empyema.

In the maternity nursery the disease mainly affected premature infants, and the outbreak coincided with an epidemic of "clinical influenza" among the mothers and nurses. The staphylococcal carrier rate among the staff was not unduly high, and staphylococci were not isolated from the infants' feeds. Most of the infants, however, were nasal carriers of staphylococci, and the pneumonia was therefore thought to have been endogenous, possibly with a virus infection as a predisposing factor. Clinically the onset was characterized by sudden collapse, leading to dehydration and cyanosis within 48 hours and without localizing symptoms. Bacteriologically Staphylococcus aureus was isolated before or after death from 27 out of 31 throat swabs, 40 out of 54 cultures from lung punctures, and about half of 50 combined lung and spleen cultures. Apart from the absence of empyema and less obvious macroscopic bronchitis, the morbid anatomy showed no significant difference from that of the first group. John Crofton

1209. Peritonitis Associated with Neonatal Diarrhea. By J. P. Doenges. J. Pediat., 31, 669-678, Dec. 1947. 2 figs., 21 refs.

Three cases of neonatal diarrhoea were complicated by non-specific ulceration of the small bowel with multiple perforations and peritonitis. One of the cases also showed similar lesions in the ascending colon and purulent erosions in an inflamed appendix. Clinically the patients had the typical projectile, greenish-white, foul watery stools of neonatal diarrhoea and showed dehydration and acidosis. A rising temperature not responding to sulphadiazine and marked abdominal, distension were the symptoms indicating the complication. In the terminal stages there was extreme. distension, leading to respiratory embarrassment, regurgitations and increasing acidosis. Abdominal rigidity was not seen and the character of the stools was not altered.

The pathological reports described the presence in the peritoneal cavity of yellowish fluid and of haemorrhagic and purulent areas on the serosa of many loops. In two of the cases collections of pus were found in the ileo-colic region. Peyer's patches and mesenteric lymph nodes were enlarged. The perforations were from r to 8 mm. in diameter and surrounded by induration. Microscopically they showed hyperaemia, polymorphonuclear infiltration, and central necrosis. The more extensive loss of mucosa than of underlying layers indicates the presence of the causal agent in the lumen of the bowel. There was no response to treatment in any

of the cases. Surgical intervention would have been futile in view of the multiplicity of lesions.

The author reviews briefly the aetiology of neonatal diarrhoea and of ulceration and peritonitis in the newborn.

H. Herlinger

1210. The Question of Sulphadiazine Treatment of Infantile Dyspepsias. (Zur Frage der Sulfapyrimidinbehandlung der Säuglingsdyspepsien.)

By R. Klose. Arch. Kinderheilk., 133, 175-180,

1947. 5 refs.

The action of sulphadiazine in the treatment of gastro-intestinal disorders in infancy was investigated. A series of 423 cases, all acute, was observed, every other child receiving sulphadiazine by mouth in doses of 0.15 g. per kilo. body weight for about 6 days. This was in addition to the routine dietetic treatment. The drug did not appear to have any effect, either on the number or the duration of the loose stools, on the mortality, or on the length of stay in hospital.

[This result is rather surprising, since all forms of gastro-intestinal disorder—dietetic, infective, or due to parenteral infection—were treated in the series.]

[J. G. Jamieson]

1211. Dry Gangrene of the Newborn. (Les gangrènes sèches du nouveau-né.)

By L. CLEISZ and J. BRET. Gynéc. et Obstét., 47, 204-211, 1948. 12 figs., 7 refs.

1212. Changes in the Bone Marrow in Megaloblastic Anemias of Infancy Before and After Folic Acid Therapy.

By W. W. Zuelzer, A. Newhall, and L. Hutaff. J. Lab. clin. Med., 32, 1217-1230, Oct.

1947. 12 figs., 7 refs

The bone marrow from 15 patients with megaloblastic anaemia of infancy was studied over a period of 21 months at the Children's Hospital, Michigan. In 6 patients erythropoiesis was of the megaloblastic type with a high proportion of basophilic cells. Seven of the patients showed classical megaloblasts in the bone marrow but these did not constitute the majority of the immature red cells. The bone marrow of the remaining 2 patients was of a normoblastic type.

The sequence of changes seen in the bone marrow after treatment with folic acid was as follows: The megaloblasts lost their characteristic structure, and in 12 to 24 hours the erythroblasts assumed an appearance intermediate between that of megaloblasts and normoblasts. Two days after the treatment started the transformation was complete and the bone marrow was essentially of a normoblastic pattern. The authors state that their findings indicate that only the late eosinophilic megaloblasts escape the effect of folic acid and are not transformed into normoblasts. This they consider to be due to the fact that the cells are past the stage where multiplication can occur. They claim

that their observations on the evolution and regression of the megaloblastic pattern do not support either the view that megaloblasts are normal constituents of the marrow or the conception that these cells are genetically different from normal erythroblasts and are immutably fixed in their characteristics by the nature of their ancestry.

R. Winston Evans

1213. Four Cases of Erythroblastosis Foetalis. (Nota clínica y anatomopatológica sobre cuatro casos de eritroblastosis fetalis.)

By E. MARTINEZ CARMONA and R. ROCA DE VINALS. *Med. esp.*, 19, 103-109, Jan. 1948. 8 figs. Bibliography.

1214. The Rh Factor in Obstetrics. Report of 572 Cases of Infants of Rh Negative Mothers, 232 of whom Received Transfusions of Mother's Blood.

By H. W. MAYES. Surg. Gynec. Obstet., 85,

432-446, Oct. 1947. 6 figs., 7 refs.

The contention of this paper is that cord transfusion of maternal blood should be performed prophylactically in infants of Rh-negative mothers. With maternal blood, in marked contrast to donor's blood, no reactions occur and the blood picture improves promptly. Of the 572 Rh-negative women (56 primiparae) delivered in the 3-year period under review 40 per cent of the babies received maternal blood, all having prophylactic cord transfusions at birth except 3 erythroblastotic infants transfused within a few days of birth. The remaining babies had no transfusion or had compatible donor's blood. Most of the premature babies were selected for maternal transfusion.

Of the 232 babies who received maternal blood, 2 had more than 50 normoblasts per 100 white cells and 5 had fewer than 4,000,000 red cells per c.mm. In 5 cases the haemoglobin was less than 100 per cent and 8 of the infants were jaundiced. Ten of the 13 babies diagnosed as having erythroblastosis received maternal cord transfusion (20 to 50 ml.) at birth and 4 of them later received Rh-negative donor blood without reaction (125 to 215 ml. in one or two transfusions). The other 3 infants were given intravenous maternal blood (80 to 90 ml.) several hours or days after birth and Rh-negative donor transfusion (90 to 100 ml.) in addition. There were Rh anti-bodies in the mother's serum in 2 cases, with a weak titre in one case and a titre of I in So in the other several days after delivery. All except 1 of the babies weighed over 6 lb. (2.7 kg.), and the author judges that premature induction of labour when erythroblastosis is anticipated is not justified. All infants receiving maternal blood survived, although the 13 mothers had previously had only 20 surviving children out of 31 preg-

Eighteen cases of erythroblastosis were diagnosed in the control group of 340 infants of Rh-negative mothers not receiving transfusion of mother's blood. One died before transfusion could be given.

In the remaining 17 cases there were 4 deaths. Five babies had more than 50 normoblasts per 100 white cells, and red cells were fewer than 4,000,000 per c.mm. in 5 cases. Twelve babies were jaundiced. The 17 mothers had had 19 living children out of 25 pregnancies. The 17 babies described received 20 to 505 ml. blood from Rh-negative donors in one to seven transfusions. Two of the fatal cases were given 20 and 25 ml. respectively. The third infant died 9 hours after an 85-ml. transfusion which had caused a severe reaction; the fourth, with a high normoblast count, survived only a day after transfusion of 105 inl. of Rh-negative blood. In the group of 572 Rh-negative mothers 23 Caesarean sections were performed for various reasons. The author considers that immediate transfusion of the infant is preferable to abdominal delivery.

During the years 1936-42, father's blood was given in 10 cases for blood dyscrasia. There were 4 deaths in the neonatal period, and it is apparent from the case reports of the others that the paternal blood regularly precipitated the fall in haemoglobin level. Six cases are tabulated of suspected blood dyscrasia amongst the infants of 5,917 Rh-positive women, but the evidence appears insufficient to warrant a diagnosis of erythroblastosis in any of them. Five received maternal and 1 donor blood. All recovered. The author considers that breast feeding is advisable for erythroblastotic infants.

[The study of the Rh factor in obstetrics has been approached from many angles and this is indeed a novel one. An enormous amount of work has been done in this investigation, but how far has it advanced our knowledge? Few people would deem it advisable to transfuse all infants of Rbnegative mothers unless the serum has been tested for antibodies. Such serological data are scarcely mentioned in this report, and the diagnosis of erythroblastosis is made on very slender evidence in some cases. The results, too, are unconvincing, since several of the infants given maternal blood also had transfusions of large quantities of Rhnegative donor blood. These infants may well have survived in spite of, not because of, 20 to 50 ml. of maternal blood. In the group not given maternal blood the cases cannot be regarded as adequate controls, because 3 out of the 5 fatal cases had a maximum of 25 ml. of donor blood. The author's opinion that Caesarean section is not advisable and that breast feeding is not harmful in erythroblastosis is now shared by many people.]

Doreen Daley

1215. A Graphic Method of Prognosis for the Infant in the Antenatal Care of Rh-isoimmunized Pregnant Women.

By T. PRIMROSE, G. J. E. VAN DORSSER, and N. W. PHILPOTT. Amer. J. Obstet. Gynec., 54, 662-667, Oct. 1947. 5 figs., 4 refs.

An analysis has been made of the results of Rh tests on all pregnant women (4,569) referred to the authors' laboratory service during 1946. From

observations of the infants born to these mothers the authors have devised a means of determining the prognosis for the baby during pregnancy. Agglutinating and blocking antibodies were sought in the sera of the Rh-negative mothers; when they were present the titre was estimated at frequent intervals throughout the pregnancy. Of the 2,960 clinic cases 33 were found to be immunized (1.12 per cent).

The grading used was as follows. Grade (1): only. slight immunization in later weeks of pregnancy. Babies do well even without treatment in the immediate post-natal period. Grade (2): antibodies appear late. Blocking-antibody titres do not rise in the last few weeks of pregnancy above a dilution of I in 8. These babies are born at term showing some clinical signs of erythroblastosis of modern severity. The blood picture at birth confirms this. Infants are usually easily saved by transfusion. Grade (3a): a sharp rise in blocking antibodies to a dilution of 1 in 32 is often followed by a sudden drop in the last 2 weeks. Babies are severely damaged, but may be saved by prompt action immediately after birth. Grade (3b): antibodies are demonstrable relatively easily in pregnancy, the titre rising to 1 in 32 with sometimes a sharp drop in the last 2 weeks. Prognosis for the baby is very poor. Babies are often stillborn at term. Grade (4a): a very sharp rise in the later months to and above a dilution of 1 in 64 with some agglutinating antibodies. Prognosis is very poor for the baby; severe anaemia with oedema develops and the infant is usually stillborn at term or a week or so before. Grade (4b): antibodies first appear in heavy concentration at about the period of theoretical viability. A macerated foetus is usually born several weeks before term. Grade (5): blocking antibodies (sometimes with agglutinating antibodies) appear in appreciable concentration at dilutions of I in 4 and over, before the twentieth week. Prognosis is hopeless in the case of an Rhpositive baby. Abortion results. The future prognosis with a homozygous Rh-positive husband is likely to be uniformly poor.

The authors have found that, in practice, results have corresponded to the forecast except in I case where the husband was heterozygous. They advise Caesarean section a few weeks before term in some cases relegated to Grades 1 and 2, but doubt if this added maternal risk is justifiable in other grades. They do not consider that further pregnancies should be attempted when the mother is Grade 4 or 5, and the husband homozygous positive. Recently methionine has been given orally to the mother during pregnancy and to the infant in the neonatal period in cases where there is evidence of isoimmunization. Results are encouraging further trial is necessary before they can be evaluated.

[It would be interesting to see this method of prognosis applied to a larger series of cases,

because the view of some other workers in this field is that the outcome does not invariably depend on the antibody level. The only individual case report included in this paper briefly refers to a woman with blocking antibodies who was delivered of an Rh-negative infant.]

Doreen Daley

1216. Studies in Erythroblastosis Fetalis. I. Activation of the Incomplete Rh Antibody by the Blood Serum of Full-term and Premature Newborn Infants.

By E. WITEBSKY, M. I. RUBIN, and L. BLUM. J. Lab. clin. Med., 32, 1330~1338, Nov. 1947. 10 refs.

It has been reported that the serum from umbilical cord blood, unlike adult serum or 30 per cent albumin solution, fails to agglutinate Rhpositive red cells treated with the incomplete or blocking-Rh antibody. This difference has been used to explain the delayed onset of symptoms of haemolytic disease of the newborn in cases where there is free antibody in the cord serum. The authors report studies on the agglutinating power of cord serum obtained from premature and full-term infants and from infants 24 and 48 hours old, and make a comparison with adult serum

There is great variation in the agglutinating power of cord serum, some samples being almost as active as adult serum, others almost inactive; sera from premature infants were consistently of low activity, while those from infants 24 to 48 hours after birth were more active than cord serum. The authors support Wiener's view that there is an activating principle, absent in premature infants and increasing in concentration during late foetal and early post-natal life, which is important in the development of manifestations of haemolytic disease of the newborn, and agree that premature induction of labour may prove a valuable therapeutic agent. It appears possible that transfusion of adult blood may supply enough activating principle to cause the symptoms to appear.

G. Discombe

1217. Studies in Erythroblastosis Fetalis. II. Investigations on the Detection of Sensitization of the Red Blood Cells of Newborn Infants with Erythroblastosis Fetalis.

By E. WITEBSKY, M. I. RUBIN, L. M. ENGASSER, and L. BLUM. *J. Lab. clin. Med.*, 32, 1339-1349, Nov. 1947. 8 refs.

The cells of some Rh-positive infants suffering from haemolytic disease of the newborn are not agglutinated by complete Rh antisera if they are suspended in saline, but are agglutinated when suspended in adult serum, whether or not this serum contains Rh antibodies; cord serum from the patient and 20 to 30 per cent albumin solution fail to cause agglutination. This test for sensitization by the blocking Rh antibody can be used either in tubes or on the tile, but appears slightly more sensitive on the tile. The method has been employed to follow the progress of exchange trans-

fusions. Oxalated normal plasma may replace adult serum in the test, but is apt to cause rouleau formation. [This application of the conglutination method appears simple and rapid.]

G. Discombe

1218. Iso-immunization by A and B Blood Factors. (Over iso-immunisatie door A en B bloedfactoren.)

By L. DE KROMME and L. A. M. VAN DER SPEK. Maandschr. Kindergeneesk, 15, 303-313, Sept.

1947. 3 refs.

Iso-immunization with A or B factors can occur after transfusions of incompatible blood, but may also take place in the so-called hetero-specific pregnancies in which mother and child belong to different "hetero-specific" blood groups. The question arises whether such a blood-group incompatibility can have harmful effects on the foetus. Von Oettingen and Witebsky consider that blood-group substances are not present in the chorionic villi, so that the placenta forms a neutral zone between mother and child and the isoantibodies of the mother are prevented from reacting with the blood-group substances of the foetal cells. The fact that anti-A and anti-B anti bodies are normally present in the mother's plasma makes the recognition of pathological cases of isoimmunization by A and B antigens more difficult and involves quantitiative determinations of anti-A and anti-B antibodies. Since the clinical symptoms of an A or B sensitization are often not very striking many cases undoubtedly escape detection.

In 42 cases of jaundice in the newborn published by Wiener, Rh-Hr factors were not a contributory cause of the sensitization, but incompatibility of the ABO blood groups was established 34 times. In a control series of 2,000 normal newborn infants Halbrecht found only 530 whose blood group was incompatible with that of the mother. Moreover, in a series of 10,000 newborn infants Halbrecht found to with a mild icterus. In this condition, described by him as icterus neonatorum praecox, the jaundice developed shortly after birth. Sometimes the icterus was accompanied by slight anaemia. The children were not seriously ill; the liver and the spleen were not enlarged and there were no haemorrhages. In 57 of these cases an incompatibility of the blood groups existed. Apart from cases of mild icterus and of congenital anaemia, incompatibility of ABO blood groups may play a part in the causation of typical erythroblastosis foetalis. In erythroblastosis in children of Rh-positive mothers the blood groups ABO of mother and child appear to be incompatible in most cases.

Of the authors' 10 cases of A or B sensitization 3 are quoted. In the first the infant had multiple petechiae, an enlarged spleen, and slight icterus. The mother appeared to be Rh-positive and had the blood formula R,-B-MN. Her 3-day-old serum strongly haemolysed blood cells of group A. The

serum was examined for possible Rh-Hr autibodies of the types anti-E, anti-c, auti-d. It did not react with R,R, and rr erythrocytes, so that the mother had not been immunized by either Rh or Hr factors. The anti-A agglutinin titre was 2048. The child belonged to group A (R,-A-MN), and the clinical phenomena were the result of an iso-immunization of the mother (B) through the blood cells of the child (A). In the second case a routine examination of the family showed that mother and child were Rh-positive; the father was Rh-negative. No antibodies against Rh-negative cells (cde/cde) could be shown in the mother's serum. The ABO types of mother (O) and child (B) were incompatible. The titre of anti-B bodies in the mother's serum was 1,024; the titre of anti-A bodies (32) was normal. The clinical report showed that the child's body was covered with haemorrhages at birth, and that 12 hours later a definite icterus appeared. Liver and spleen were enlarged. (The mother had had an attack of rubella in the second month of pregnancy.) In the third case the infant at birth had haemorrhages all over the body, especially numerous on the trunk, the spleen was enlarged. The mother had had rubella in the third month of pregnancy. Both parents were Rh-positive. The blood group of the mother (O) and that of the child (A) were incompatible. Two months after parturition the mother's blood showed a titre of 256 for anti-A antibodies, which is higher than normal.

Probably there is some connection between the occurrence of rubella and of other infectious diseases during pregnancy, the iso-sensitization of the mother, and the clinical signs in the child. In cases of congenital abnormality, especially if there is a history of infectious disease during pregnancy, the blood groups should be determined. If the blood groups are incompatible the antibody-titre of the mother's serum must be estimated. Man appears to be more sensitive to A and B antigens than to the Rh factor. In cases of Rh antagonism between mother and child the A or B antigens of the foetus may suppress the action of the Rh antigens.

B. L. Frank

1219. Breast-feeding in Erythroblastosis Foetalis. By I. A. B. CATHIE. Brit. med. J., 2, 650, Oct. 25, 1947. 3 refs.

Rh antibodies are commonly found in the breast milk of mothers who have borne erythroblastotic babies. It has been suggested that ingestion of this milk may have a deleterious effect on the recovery of an infant whose blood cells have already been subjected to the action of this antibody. The author describes experiments carried out to disprove this hypothesis.

Fasting gastric contents were obtained from 20 babies, aged from 1 week to 1 year; a wide range of gastric acidity was present. Equal volumes of gastric secretion and serum with a high Rhantibody titre were incubated together for 1 hour at 37° C. No fall in antibody titre was noted in any case, indicating that Rh antibodies are not

readily destroyed by gastric juice. In an attempt to demonstrate absorption from the stomach, serum containing antibodies was fed by mouth. Blood samples were taken afterwards and tested for antibodies. The indirect method, which is more sensitive than the ordinary test, was used. An Rhpositive volunteer drank 15 oz. (426 ml.) of a serum with an anti-Rh titre of 256. Twelve Rh-positive infants suffering from such conditions as inoperable spina bifida were fed for a complete day with hightitre serum. In none of these cases was sensitization of the cells demonstrated, nor did the serum sensitize other Rh-positive cells. A direct Coombs test was performed daily on a baby with erythroblastosis. The test became negative on the third day. On this day and for a subsequent 24 hours only high-titre serum was fed. Again no sensitization of the red cells occurred and no antibody could be demonstrated. A similar experiment with breast milk with an anti-Rh titre of 32 gave a similar result. To complete the series the observations were repeated on babies with haemolytic disease, the incomplete or blocking antibody being used. Again no evidence of absorption was found.

The author concludes that although Rh antibodies are not apparently destroyed in the stomach no evidence exists that they are absorbed into the blood stream. The weaning of babies with erythroblastosis because the breast milk contains antibodies is therefore not justifiable and these babies should, wherever possible, be breast-fed.

[This is important work in the field of erythroblastosis. Weaning of a newborn baby is always undesirable and more so in a case where the baby is ill or premature. The author appears to have produced conclusive evidence that it is safe to continue breast-feeding in these cases, even when antibodies can be demonstrated in the breast milk.]

Josephine Barnes

1220. Exchange Transfusion in Erythroblastosis. (La sustitución de la sangre en el recién nacido con eritroblastosis.)

By H. L. Cofre and M. Schepeler. Rev. chil. Pediat., 18, 733-755, Oct. 1947. 32 refs.

1221. Exchange Transfusion for Erythroblastosis Fetalis.

By A. W. CAVINS. J. Indiana med. Ass., 41, 214-215, Feb. 1948. 2 refs.

1222. Technique of Suckling. (Stilltechnik.)
By W. R. MERZ. Praxis, 37, 178-182, Mar. 11, 1948. 1 fig.

1223. The Adequacy of Artificial Feeding in Infancy.

By S. S. STEVENSON. *J. Pediat.*, 31, 616-630, Dec. 1947. 39 refs.

The common objections to cow's milk as an infant food are criticized. The only valid objection to artificial feeding accepted by the author is the higher morbidity and mortality rate associated with it. The author presents a record of 263 infants in

their first year of life. The average number of respiratory infections per infant in the breast-fed was 1.56 as against 2.18 in the artificially fed, and respiratory infection accounted for 85 per cent of all infections. The difference in incidence of respiratory infection is greater in the second half-year of life. There was no significant difference between the two groups as regards gastro-intestinal and other infections.

The vitamin contents of cow's milk are compared with those of breast milk; the latter has a relative abundance of vitamin A and ascorbic acid, and it is suggested that vitamin A may be stored in a breastfed infant's body and so enhance his resistance to respiratory infection. A similar claim is made for ascorbic acid, and a case is made out for giving larger doses of both, beginning at birth. The dose of vitamin A should be 220 i.u. per pound (0.45 kg.) body weight daily and of vitamin C 100 mg. per day. There is evidence that an infant absorbs both these vitamins better when he is breast-fed, and that they may be the substances which confer greater resistance to respiratory infection in the second 6 months of life.

[This is an interesting paper because it illustrates the trend of thought in the United States in relation to the value of breast-feeding, but the author's statement that there is no significant difference between breast-fed babies and those receiving correct artificial feeding in the incidence of diarrhoea and miscellaneous infections would be challenged by many paediatricians in Britain.]

A. G. Watkins

1224. Fetal and Neonatal Mortality: Causes and Prevention.

By W. F. MENGERT. Amer. J. Obstet. Gynec., 55, 660-668, Apr. 1948. 21 refs.

1225. Fetal and Maternal Mortality. An Elevenyear Survey.

By N. S. Assall and L. F. Zacharias. *Amer. J. Obstet. Gynec.*, 54, 651-661, Oct. 1947. 6 figs., 9 refs.

The authors have analyzed the statistics of over 15,000 deliveries during an 11-year period and have studied the foetal and maternal mortality in this

group.

During the second half of the period deliveries were on the whole supervised by obstetricians and rules for delivery, including performance of Caesarean section and the use of high forceps, were laid down. During this latter period, there was a marked reduction in foetal and maternal mortality, which supports the authors' plea that deliveries should be carried out by obstetric specialists and not by general practitioners. The causes of death resemble those already published in other investigations of maternal deaths, haemorrhage and shock being responsible for 28 per cent, infection for 25 per cent, and toxaemia and cardiac diseases for 18 per cent each. Only I death was attributed

to frank puerperal sepsis. Foetal mortality was again highest among premature infants, while the lowest incidence of foetal deaths occurred in forceps delivery. The authors feel justified in condemning the use of high and mid-forceps, but stress the value of low forceps as a method of choice. Breech deliveries accounted for over 17 per cent of foetal deaths in this series.

E. D. Grasby

1226. Clinical and Statistical Study of Foetal and Neonatal Death. (Contributo clinico-statistico allo studio della nati-neonatimortalità.)

By T. Nobile. Ginecologia, Torino, 14, 20-31, Jan. 1948. 8 refs.

r227. Foetal Mortality due to Deficiencies in the Practice of Obstetrics by Midwives. (La mortinatalidad de responsabilidad previsible en relación con deficiencias en la aplicación directa del arte obstétrico por parteras en maternidades.)

By J. B. González. Obstet. Ginec. lat.-amer.,

5, 69-93, Mar.-Apr. 1947.

In this article, which is one of a series dealing with the factors responsible for foetal mortality in a municipal hospital in Buenos Aires over a period of 10 years, the author discusses the findings in the babies born to those multigravidae who were attended by midwives under the control of an obstetrician. In this group there were 99 foetal deaths for which obstetrical factors were responsible, out of a total number of 526 investigated. Premature babies (weighing between 1,600 and 2,990 g.) provided 61.6 per cent of all cases. Investigation of the length of labour showed that in 46.46 per cent the limit of 12 hours, which the author considers to be the maximum time for normal labour in multigravidae, was exceeded. Face presentations were found in 2.02 per cent of cases and breech presentations in 18.17 per cent, compared with the usual figures of 0.5 and 2 per cent respectively. The influence of antenatal treatment is shown by the fact that out of a total foetal mortality rate of 2.86 per cent among the patients in this group, only 0.8 per cent represented the loss in those admitted before labour started, while 2.06 per cent occurred in those patients admitted in labour. Obstetrical practice should consist in making a physiological process of pregnancy and labour rather than in correcting complications.

#### Bryan Williams

# MATERNAL MORBIDITY AND MORTALITY.

1228. Motor Disturbances of Nervous Origin after Delivery (Neuritis of the Lumbo-sacral Trunk). (Troubles moteurs d'origine nerveuse consecutifs a l'accouchement. Nevrite du plexus sacré (Tronc lombo-sacré).)

By J. Bret. Rev. franç. Gynéc., 42, 354-364,

Dec. 1947. I fig., 10 refs.

1229. Paralysis of the External Popliteal Nerve after Labour. (A propos des paralysies du sciatique poplité externe dans le post-partum.)

By P. LANTUEJOUL. Gynéc. et Obstét., 47, 58-

59, 1948. 1 ref.

1230. A Study of Maternal Mortality in Canada. By M. Kerr. Amer. J. Obstet. Gynec., 55, 396-402, Mar. 1948.

1231. A Study of Maternal Deaths in the Philippine General Hospital.

By A. Baens. *J. Philippine med. Ass.*, 34, 75-81, Feb. 1948. 5 refs.

1232. Maternal Mortality in the South. An Analysis of One Hundred and Seventy-five Deaths.

By F. R. Lock. Sth med. J., 41, 228-237, Mar. 1948. 10 refs.

# OBSTETRIC OPERATIONS.

1233. The Use of Forceps in Obstetrics. By W. L. THOMAS. Carolina med. J., 9, 78-80, Feb. 1948.

1234. Subcutaneous Symphysiotomy. (La sinfisiotomía subcutánea.)

By L. Guilera Vallhonrat. *Med. esp.*, 19, 89-94, Jan. 1948. 15 refs.

1235. History of Caesarean Section in the Pre-antiseptic Period. (Z historie cisarskeho rezu v době predanti-septické.)

By M. MATOUSEK. Ceshoslov. Gynaek., 13, 81-

101, 1948. 12 refs.

1236. The Changing Trends in Cesarean Section. Analysis of Cesarean Sections Performed in Detroit in 1925, 1930 and 1945.

By H. C. Mack and R. S. SIDDALL. *J. Michigan* med. Soc., 47, 288-293, Mar. 1948. 4 refs.

1237. Which Type Cesarean Section?

By R. J. Heffernan and C. L. Sullivan. *New Engl. J. Med.*, 238, 241-248, Feb. 19, 1948. 8 figs., Bibliography.

1238. Comparative Morbidity in Cesarean Section. By V. J. Turcotte and H. F. Jarvis. J. Michigan med. Soc., 47, 294-296, Mar. 1948. 18 refs.

1239. Postmortem Cesarean Section Delivery of Twins, with Survival. (Case Report.)

By F. H. Dobbs. West Virginia med. J., 44, 80-82, Apr. 1948. 6 refs.

1240. Discussion on Anaesthesia for Caesarean Section.

By R. C. Thomas, J. H. Peel, C. McI. Marshall, K. Lloyd-Williams, C. J. M. Dawkins, J. N. Cave, L. Snaith, H. J. Malkin,

and J. B. Cochrane. *Proc. roy. Soc. Med.*, 40, 557-568, Aug. 1947. 6 refs.

Thomas discussed spinal analgesia. The requirements for an anaesthetic for Caesarean section are safety for the mother and child and operating ease for the surgeon. Provided that certain precautions are taken, spinal analgesia fulfils these conditions. The agent used is "nupercaine" (1 in 200), which is a quinoline derivative; thus the dangers arising from the pregnant woman's susceptibility to cocaine derivatives are avoided. The amount necessary is usually 2 ml., though less can be used for short women. Rigid asepsis ensures avoidance of meningitis, and care should be taken to avoid the solution arising above D8, or paralysis of the vasoconstrictors, bringing about a sudden fall in blood pressure, may occur. Ephedrine, gr. 3/4 (48 mg.) is given beforehand; should the systolic pressure fall below 80 mm. Hg "methedrine", 15 mg., is injected into the uterine muscle. The intrathecal injection is made with the patient lying on her side; she is then turned on to her back, the head and shoulders are raised, and the table is given 7 to 10 degrees head-down tilt. After 5 minutes the table is straightened and the operation can be started. The incidence of postoperative headache is minimized by using a fine needle, keeping the patient flat for 24 hours, and raising her very gradually to the Fowler position.

The advantages of this method are: (a) It is safe for the mother and easy to administer. (b) The amount of movement of the patient is small. (c) The patient can hear her child cry and see it almost immediately. There are no ill-effects on the child. (d) The surgeon has maximum ease of operating. (c) Convalescence is smooth; vomiting, distension, and chest complications are rare, but headache does occur. The series comprised 346 cases, 350 infants being delivered, with a salvage rate of 96 per cent. The majority of the operations

were performed for disproportion.

Peel discussed caudal analgesia, which is not ideal but is very valuable and deserving of a more extensive trial than it has hitherto been given in Britain. The dangers of the inhalation and intravenous agents in causing foetal narcosis are well known; the disasters of spinal analgesia are obviated by the use of the extradural space. The method consists of the injection of 60 to 100 ml. of 1.5 per cent "metycaine" into the sacral canal through the sacral hiatus. Precautions are taken against tapping the subarachnoid space and against a too rapid injection of the fluid. The technical difficulty provides the main drawback to this method; 10 per cent of female sacra show anatomical abnormalities that may preclude successful use of this method, and a further 10 to 15 per cent of women have such large pads of fat over the sacrum that it is impossible to identify hiatus. Furthermore, it may be 20 to 40 minutes from the time of the injection to the moment when the patient is ready for the surgeon. When obtained,

the result is perfect. In a series of 51 cases there liave been no maternal deaths or stillbirths; the 3 neonatal deaths were in no way related to the drug. The operation can be performed without hurry; the field is perfectly avascular and the baby cries immediately on delivery. It is not considered necessary to use either vasopressor or oxytocic drugs, but the patient is given morphine gr. ¼ (16 mg.) after the baby has been delivered, the usual premedication having been omitted. The Trendelenburg position can be used without danger and the post-operative course is smoother than after general anaesthesia.

McIntosh Marshall, in discussing local analgesia, said that there are many reasons why inhalational anaesthesia is dangerous in obstetrics. Premedication is cut down in the interests of the child, and for the same reason, the plane of anaesthesia is light; the risk of vomiting and aspiration of the stomach contents is very real. If the slight degree of anoxia which accompanies most inhalational anaesthetics is aggravated by laryngeal spasm or vomiting, this is quickly reflected in the child. When labour has been prolonged, uterine action is poor, the membranes have been ruptured for many hours, or foetal distress is evident; all these dangers are enhanced and general anaesthesia is contra-indicated. The choice lies between spinal and local analgesia; spinal analgesia is very near to being ideal, but mishaps and disasters can occur. Local analgesia is absolutely safe, and no tragedies arising from its employment in Caesarean section have ever been reported. Its use should be considered in all poor-risk cases, toxaemias, diabetes, pulmonary and cardiac disease, and in all cases of prematurity. If necessary, a small amount of "pentothal" (thiopentone) can be given just before the uterus is incised, without harm to the child. In the case of an uncorrected transverse position, the lower uterine segment should not be opened under local analgesia alone, as the back or an arm or shoulder may fall into the wound and extraction become almost impossible.

Records of Royal Free Hospital cases were discussed by Lloyd-Williams.

Ethyl-chloride-ether gave good results but entailed frequent resuscitation of the infant. Chloroform up to the delivery of the infant, followed thereafter by ether, did not appear to have such a depressant effect on the foetal respirations. With gas and oxygen it may be necessary to add some chloroform; this is preferable to increasing the amount of gas and oxygen; ether can be given after delivery. From the surgeon's point of view results with spinal analgesia were good. After operation paraldehyde 5 to 6 dr. (17.5 to 21 ml.) was given and postoperative distension was diminished by discouraging excessive intake of fluids. No deaths occurred in the series, though headache and backache were common in the early cases. When the lower-segment operation became more popular the use of spinal analgesia waned. The operation is

more prolonged and the increased manipulation puts a considerable strain on the patient. Extraction appears to be more difficult because of contraction of the uterus. The present method is to give hyoscine gr. 1/200 (0.32 mg.) I hour preoperatively, followed by "pentothal", gas and oxygen. After delivery, "omnopon", gr. 1/3 (22 mg.) is given intravenously.

Dawkins said that at University College Hospital the best results were obtained from epidural analgesia, which had been used in 20 cases. Premedication consists of 100 mg. of pethidine given 11/2 hours before operation and repeated 1 hour later. Pressor drugs are used only where there is a tendency for the blood pressure to fall. The patient lies on her side with the spine flexed, and the epidural space is entered between L2 and L3. Odom's indicator is attached to a Howard Jones needle, which is advanced slowly through the ligamentum flavum until the air bubble in the indicator is sucked inwards by the negative pressure in the epidural space; 10 ml. of "nupercaine", I in 600, is injected, with occasional aspiration to ensure that cerebrospinal fluid is not withdrawn. After an interval of 5 minutes the patient is asked to move her toes; if she can do so then the subarachnoid space has not been entered, and injection can proceed. A further 35 ml. is injected, the patient still being asked to move her toes and aspiration being repeated. The usual time interval for the production of analgesia is 25 minutes. All the babies breathed spontaneously. There were headaches, chest complications, or urinary troubles. Relaxation was good, retraction of the uterus was satisfactory, and there was no postpartum haemorrhage. The postoperative state was good. The advantages of epidural block over spinal analgesia are that there is no risk of meningitis, the fall in blood pressure is less, and there is no headache.

Cave stated that of a series of 13 Caesarean sections performed with inhalation anaesthesia, there was some difficulty in establishing foetal respiration in 9, whereas of 15 performed with spinal analgesia, 14 infants cried as soon as the head was free. Spinal analgesia gives the best chance of a live child, with the least risk of postpartum haemorrhage.

Smith had used local analgesia supplemented by pentothal, cyclopropane, or gas-and-oxygen in 200 to 300 cases, and had found it satisfactory. Occasionally, however, the child which had started by crying well relapsed into a condition of collapse resembling white asphyxia.

Malkin had performed 736 Caesarean sections under spinal analgesia, in the majority of which light "duracaine" was used. There were 8 fatalities, none of which was attributable to the analgesic.

G. C. Steel

1241. General and Local Anaesthesia in Caesarean Section and the Risk of Foetal Anoxia. (Les anesthésies générales et locales dans les opérations césariennes et le risque d'anoxie fœtale.)

By M. Mayer and —. Jacquemin. Gynéc. et Obstét., 47, 49-57, 1948.

1242. Anaesthesia for Caesarean Section. (Anestesie pri sectio caesarea.)

By L. Spinadel. Ceskoslov. Gynaek., 13, 158-164, 1948.

1243. Anaesthesia for Caesarean Section. (Anestesie u cisarskych rezu.)

By Z. MIRATSKA-TUMOVA. Ceskoslov. Gynaek., 13, 127-141, 1948. 21 refs.

## MISCELLANEOUS.

1244. The Renaissance of Eugenics in Italy. (Per la rinascita dell'eugenica in Italia.)

By E. MORACCI. Arch. Ostet. Ginec., 53, 9-24, Jan.-Feb. 1948. 25 refs.

1245. Obstetrics in the Small General Hospital. By C. E. Conner. Surg. Gynec. Obstet., 86, 499-501, Apr. 1948. 4 refs.

1246. Clinical and Statistical Data of Ten Years' Work at the Obstetric and Gynaecological Clinic of Bologna. (Rilievi clinico-statistici sull'attività di un decennio nella clinica Ostetrica e Ginecologica di Bologna.)

By C. Belvederi and L. Gianaroli. Riv. ital. Ginec., 31, 3-196, 1948. 9 figs. Bibliography.

1247. Six hundredth Anniversary of Charles University in Prague. The Picture of Obstetrics and Gynaecology in this Period. (Prace Puvodní. Porodnictví a gynaekologie na lékarské fakultě Karlovy university v Praze ja jejiho 600 letého trvání (1348 az 1948).)

By M. Matousek. Ceskoslov. Gynaek, 13, 112-127, 1948. 34 refs.

1248. Venous Thrombosis in Obstetrics and Gynae-cology. (Acerca das tromboses venosas em obstetrica e ginecologia.)

By M. QUEIROZ DE BARROS. Rev. Ginec. Obstet., 1, 150-166, Feb. 1948. 2 figs., 44 refs.

1249. Perforation of the Posterior Fornix and Pouch of Douglas During Coitus.

By S. Lask. *Brit. med. J.*, 1, 786, Apr. 24, 1948. 2 refs.

### GYNAECOLOGY.

General.

1250. Rare Changes in the Bones of the Pelvis in Gynaecological Radiological Diagnosis. (Seltenere Knochenveränderungen der Beckengegend in der frauenärztlichen Röntgendiagnostik.)

By H. Deuel. Gynaecologia, Basel, 125, 73-86,

Jan.-Feb. 1948. 24 figs., 26 refs.

Disorders of Function.

1251. The Characteristics of Uterine Bleeding following Cyclic Oral Therapy with Estrogen and Progesterone.

By J. W. GOLDZIEHER, L. W. HAUS, and E. C. HAMBLEN. Amer. J. Obstet. Gynec., 54, 636-642,

Oct. 1947. 4 figs., 8 refs.

The author investigated 86 patients suffering from functional disturbances of uterine bleeding to whom oestrogens alone or with progesterone were given from the fifth to the twenty-fifth day of the cycle. The latent period before the onset of hormone-withdrawal bleeding was carefully charted in each case, and was found to be shorter (mean 2.7 days) in the group receiving oestrogen-progesterone treatment than in those receiving oestrogen only (mean 5.4 days). This confirms the previous animal experiments. Patients with menorrhagia responded more quickly to oestrogen withdrawal than those in whom there was scanty bleeding, and tended to bleed longer. It was further observed that the latent period was not affected by increasing the dose of oestrogen or by the choice of synthetic or natural oestrogens. E. D. Grasby

1252. Modern Views on the Hormone Treatment of Functional Disturbances of the Menstrual Cycle. (Moderne vedute nel trattamento ormonale delle turbe funzionali del ciclo.)

By L. GIANAROLI. Riv. ital. Ginec., 31, 213-222, 1948. 3 refs.

1253. The Value of Basal Body Temperature. Vaginal Smear, and Endometrial Biopsy in the Diagnosis of Functional Disturbances of the Ovary. (El valor de la temperatura basal del cuerpo, frotis vaginal y biopsia de endometrio en el diagnostico de los trastornos funcionales del ovario.)

By J. ZANARTU ORREGO and A. ATRIA RAMIREZ. Bol. Soc. chil. Obstet. Ginec., 12, 152-166, Aug. 1947. 10 figs., 24 refs.

1254. Herpes Menstrualis.

By N. A. Andersen. Gynaecologia, Basel, 125, 170-175, Mar. 1948. 7 refs.

1255. A Case of Vicarious Bleeding into the Conjunctiva. (Ueber einen Fall vikariierender Blutung in die Konjunktiva und blutiger Tränen.)

By K. HEYROWSKY. Wien. klin. Wschr., 59.

702-704, Oct. 24, 1947. I fig., 12 refs.

A case of vicarious menstruation in a married woman of 26 is reported. She had never had a period, but since the age of 16 had experienced cyclical bleeding from both conjunctivae. Five other members of the family had the same condition, but two also menstruated at the times of ocular haemorrhage. The patient had an adiposogenital syndrome and responded to treatment (change of occupation, diet, exercise, sex hormones) by menstruating normally and ceasing to bleed from the conjunctiva.

S. S. B. Gilder

1256. Dysmenorrhea.

By E. T. Montgomery. *Industr. Med.*, 17, 94, Mar. 1948. 5 refs.

1257. Dysmenorrhoea and Methyltestosterone. (Dismenorrea y metiltestosterona.)

By R. PINEDA and G. CAMPAGNOLI. Rev. esp. Obstet. Ginec., 7, 52-56, Jan.-Feb. 1948.

1258. Myometrial Physiology and its Relation to Pelvic Pain.

By R. A. Woodbury, R. Torpin, G. P. Child, H. Watson, and M. Jarboe. J. Amer. med. Ass., 134, 1081-1085, July 26, 1947. 5 figs., 11 refs.

Moir has observed that intrauterine pressure in dysmenorrhoea may reach levels exceeding the blood pressure. However, many excellent spasmolytics fail to relieve menstrual pain. The authors have investigated this anomaly with the aid of electro-uterograms by using small balloons fastened to ureteric catheters, intrauterine electrodes being preferred to extrauterine ones. Intravenous acetylcholine and histamine did not cause pain or show appreciable changes in uterine activity in either control patients or those with dysmenorrhoea. Intravenous "pitocin" in doses which induced definite uterine activity did not cause distress "Pitressin", however, in a dosage with onetwentieth the oxytocic activity of the pitocin previously given, produced distress, cramps, increased frequency and amplitude of contractions, and elevation of uterine tone in all 25 patients investigated. The rapidity of onset of the action of this drug is strong evidence in favour of its action being direct and not secondary to vasoconstriction. Apparently, bio-assay of these preparations is unsatisfactory. The suggestion is made that effective uterine antispasmodics must have an anti-pitressin effect on the uterus and that "trasentin" and "pavatrine" do not possess such power.

The effect of stretching the uterus by distension of the balloon was investigated; normal controls tolerated an average distension of 5 ml., while dysmenorrhoeal nulliparous patients tolerated an average of 3.5 ml. Pressure records showed that the contractions in the latter group of patients were co-ordinated with extremely high pressures (up to 340 mm. Hg), poorly co-ordinated with high pressures, or unco-ordinated with low pressures. Summation, refractory period, and tetany were demonstrated. The pressure at which pain was felt

in different cases varied greatly.

When contractions were co-ordinated discomfort

when contractions were co-ordinated discomfort was usually felt at a pressure of 70 to 100 mm. Hg and distress at 140 to 180 mm. Hg. In the presence of incomplete or complete tetany, pain was always severe at much lower pressures; it was usually

severe at pressures of 40 to 80 mm. Hg.

Pressure records at various levels of the uterus showed definite difference. The shortest contractions were observed in the region of the cervix, and the musculature of the dome of the fundus was the slowest to contract and relaxed even more slowly.

From the fundus downwards the musculature was found progressively to contract faster and relax faster and more completely. Intrauterine debris is pushed out during relaxation and not during contraction. Disorganized contractions fail to propel menstrual debris downwards. In some patients the disorganized contractions lead to formation of a constriction ring, which further obstructs the outflow. Though myometrial activity is an important factor in producing distress of dysmenorrhoea, the amount of oedema, congestion, tissue fragility, heightened tissue irritability, and fibrinolysis of menstrual debris are also important.

[This is an excellent article, and it is to be hoped that the authors will by similar technique discover the most effective anti-pitressin drug for therapeutic use.]

Doreen Daley

1259. Rise in Blood Pressure as an Objective Sign for Pain, especially in Dysmenorrhoea. (Blutdrucksteigerung als objektives Zeichen für Schmerzen, insbesondere für Dysmenorrhoe.)

By P. GERLACH. Zbl. Gynäk., 69, 396-400, 1947.

I fig., II refs.

Any painful stimulus applied to a skin with normal sensation causes a rise in blood pressure. The same applies to spontaneous pain associated with such conditions as peptic ulcer or tabetic crises. Blood-pressure readings taken from 15 student nurses and midwives with painless menstruation showed that there is an average rise in systolic pressure of 5.6 mm. Hg in the premenstrual period and a fall of 5.6 mm. Hg during the menstrual flow, pressure again becoming normal at the end of the period. In 8 cases of dysmenorrhoea the rise above normal was 9.5 mm. Hg systolic and 8.7 mm. Hg diastolic, this rise coinciding with the days of severe pain. After these the blood pressure fell to physiological levels. Blood-pressure readings can be used as an objective sign of dysmenorrhoea if they are taken during a whole cycle. L. Ganz

1260. Dysmenorrhea and Ovulation: Correlation of the Effect of Estrogen Therapy on Pain, the Endometrium, and the Basal Body Temperature.

By L. W. Haus, J. W. Goldzieher, and E. C. Hamblen. Amer. J. Obstet. Gynec., 54, 820-828, Nov. 1947. 3 figs., 19 refs.

The authors have been impressed by the invariable relation of functional dysmenorrhoea to the presence of a progestational endometrium or to a basal temperature curve of ovulatory type.

Fifty-four unselected patients were studied over 228 cycles; 82 biopsies of the endometrium were taken and 11 basal temperature readings recorded. Oral therapy from the fifth to the fifteenth or from the fifth to the twenty-fifth days of the cycle consisted of from 5 to 60 mg. diethylstilboestrol and from 6.25 to 75 mg. "premarin" (oestrone sulphate). In considering results one complete relief of pain was taken as a standard. A total dose of less than 25 mg. premarin or less than 20 mg.

diethylstilboestrol was given to 33 patients, and of these 12 (36.4 per cent) obtained complete relief; 72.7 per cent had complete relief when the dose of premarin was raised from 50 to 75 mg. or that of diethylstilboestrol from 40 to 60 mg. anovulatory cycles were pain-free. All ovulatory cycles were accompanied by pain save in one instance in which an early progestational endometrium was associated with no pain." No gross disturbance of the cycle or other complication was seen as a result of treatment, which is only temporary and is not curative. The resulting temporary sterility does not impair subsequent ovarian function. This treatment should not be used for patients in whom pregnancy is desirable. The probable part played by progesterone in the causation of dysmenorrhoea is discussed.

G. Gordon Lennon

1261. The Treatment of Amenorrhoea by Progesterone and its Possible Use in the Diagnosis of Pregnancy. (Die Amenorrhoebehandlung durch Progesteron und ihre mögliche Ausnutzung zur Schwangerschaftsdiagnose.)

By P. Caffier. Zbl. Gynäk., 69, 10-25, 1947.

14 refs.

In treating amenorrhoea by corpus luteum hormone the author set out to determine: (1) the regularity with which bleeding could be produced; (2) whether the bleeding was true menstrual or of a pseudo-menstrual type; (3) the reliability of the method in the diagnosis of pregnancy; and (4) its influence on the psychological and physical condition of the women.

He injected on 5 consecutive days 10 mg. "proluton" (progesterone) with, in the later cases in the series, the addition of 1 mg. "progynon" (oestrone) on the same days. In the 30 cases treated the period of amenorrhoea varied from 2 months to 15 years; in every case bleeding was produced when proluton was given with progynon. When proluton alone was used there were 2 failures.

In only I case did the bleeding appear to be of a true menstrual type, as shown histologically. This patient, aged 24, had had amenorrhoea since her confinement I year previously. Regular rhythmical bleeding followed two courses of proluton. Spontaneous bleeeding occurred in only 4 of the 30 cases, some 4 weeks after the bleeding induced by prolution. In only 2 cases, the one already quoted and another with almost similar history, did regular cyclic bleeding persist. The author therefore concludes that the treatment is substitutional and that no stimulation of the ovary results. There were only 3 other cases in the series in which the endometrium was found to be in the secretory phase after proluton administration. In none of these cases could the possibility be excluded that the secretory phase might have been present before treatment. The author has observed a case in which the endometrium was found to be in the

secretory phase after 7 years' amenorrhoea, although no treatment had been given; Lauterwein found the secretory phase to be present in 13.7 per cent of cases of secondary amenorrhoea.

In 26 of the cases treated the endometrium was either in the proliferative phase or atrophic. The author discusses (mainly theoretically) the uniformity of the capacity of the uterus for bleeding despite the variability of the endometrical picture. He concludes that bleeding is the standard reaction of the uterus to stimulation, either by sex hormones or through nervous pathways, especially through the sympathetic nervous system.

The author decided to assess the value of a course of proluton in cases of secondary amenorrhoea where the presumptive diagnosis was early pregnancy, anticipating that no bleeding would occur. In 30 such cases no bleeding occurred. Proluton was given in 3 cases of disturbed pregnancy: (1) A multipara, 4 months' pregnant, was admitted to hospital with a high temperature and vaginal bleeding; after a course of proluton bleeding ceased and the patient was subsequently delivered at term of a living child. (2) A patient, who complained of irregular menstruation for 6 months, had a soft uterus, enlarged to the size of a 2 to 3 months pregnancy. After proluton there was profuse bleeding; a curettage was performed and the products of a missed abortion were removed. (3) A patient with 2 months' amenorrhoea had lower abdominal pain and slight vaginal bleeding. Proluton was given, but on the third day there was marked bleeding, which continued until operation 2 weeks later, when a tubal pregnancy was treated. It is concluded that proluton may justifiably be used without danger in secondary amenorrhoea and may help in the diagnosis of pregnancy.

The author tried to assess the value of proluton in relieving the nervous symptoms, headache, languor, and disability which often accompany secondary amenorrhoea. Although proluton produces bleeding only once, this occurrence has a good psychological effect on the woman, and many of the other symptoms disappear or are considerably improved.

Gladys Dodds

1262. Mechanism of Action of Block of the Superior Cervical Ganglion in Amenorrhoea. (Nouvelles études sur le mécanisme de l'action des infiltrations du ganglion cervical supérieur dans les aménorrhées.)

By A. NETTER. Sem. Hôp. Paris, 24, 296-297,

Feb. 6, 1948.

The authors have already published observations on the use of procaine infiltration of the superior cervical ganglion in gynaecological disorders. The theoretical basis for this is that this ganglion represents the sympathetic nerve supply of the pituitary gland, and that disorders of pituitary origin may be improved by the vasomotor or trophic changes resulting from this procedure. Endometrial biopsies have revealed that procaine injection of the superior cervical ganglion in favourable cases

causes ovulation. The method has been used in cases of amenorrhoea, anovular bleeding, and sterility due to failure of ovulation. In cases of amenorrhoea some of the successes that have been achieved must be attributed to other causes, since bleeding occurred too soon for there to have been a formation of secretory endometrium. Four cases of amenorrhoea are described in which bleeding started very shortly after the injection and must have been of an anovulatory type. In 2 other cases endometrial biopsy revealed non-secretory endometrium, although bleeding took place some time after the injection. In I case regular cyclical haemorrhage followed the injection. This treatment, therefore, appears to cause anovular uterine haemorrhage, the mechanism of which is obscure. It is necessary to use a bilateral infiltration. Unilateral infiltration was ineffective.

Josephine Barnes

1263. Amenorrhoea as a Result of Psychic Traumata. (Brak miesiaczki spowodu przezyc psychicznych.)

By W. Major. Polsk. Tyg. lek., 2, 990-993,

Sept. 1947.

1264. The Use of High Voltage Roentgen Therapy in the Treatment of Amenorrhea and Sterility in Women.

By I. I. KAPLAN. Amer. J. Roentgenol., 59, 370-377, Mar. 1948. 13 refs.

1265. Diagnosis and Treatment of Amenorrhoea. (Diagnostic et traitement des amenorrées.)

By M. C. Beclere. Rev. Ginec. Obstet., 1, 115-127, Feb. 1948.

1266. Intravaginal Implantation of Hormone Pellets.

By B. Zondek. Lancet, 2, 423-424, Sept. 20,

1947. 3 figs., 10 refs.

Rate of absorption is a decisive factor in activity of hormones given therapeutically. To prolong the hormonal action it is necessary to prevent rapid absorption from the site of the injection. Esters can be used to achieve this result in oestrogen therapy, and in recent years subcutaneous implantation of pellets has been tried with the purpose of prolonging the effect further. The author found that in some cases treated in this way results were unsatisfactory because fibrosis resulted in encapsulation of the pellets, which were thus rendered ineffective. He has shown experimentally that the activity of the oestrogenic hormone was greatly increased when the hormone was injected near its target organ—that is, in the vaginal mucosa. The dose of oestrone necessary to elicit oestrus by the intra-vaginal route is only a fifth of that required by the subcutaneous and intramuscular routes. The author has implanted hormone pellets intravaginally in 200 cases of menopausal and menstrual disorders, and claims that the advantages of this site compared with subcutaneous tissue are: smoother absorption, 5 to 6 times greater effect,

and much slighter risk of expulsion. He describes the technique as follows:

After disinfection of the vulva and vagina with an antiseptic cream of 1.5 per cent p-chloroxylenol (" dettol" or " bazylan") a wheal is produced in the posterior wall of the vagina 2 to 3 cm. above the introitus vaginae by injection of I to 2 ml. of a 0.5 per cent procaine and adrenaline solution. A Kocher clamp is attached to the wheal so that the posterior vaginal wall can easily be drawn forward. The submucosa over the Kocher clamp is infiltrated with procaine, a total of 5 to 10 ml. being given. About I to 2 cm. above the clamp a second clamp is applied and a cross incision, I cm. long, is made into the vaginal mucosa with scissors. The superior and inferior mucosal borders are then each fixed with Kocher clamps and slightly stretched apart. The vaginal mucosa is lifted from the fascia with a bent clamp, a procedure greatly facilitated by the infiltration with procaine and adrenaline. A hollow space is thus formed in which two or three pellets can readily be implanted at different points. The implantation is made with a glass tube about 3 mm. in diameter in which the pellets lie. They are expelled from the tube in the correct location with the help of an inner rod. The wound is closed with two or three catgut stitches. The patient is kept under observation in the clinic for half an hour for possible after-effects of procaine and adrenaline, and in released at the end of this time with advice to rest for a day or two. In rare cases in which bleeding has taken place a vaginal tampon has been inserted."

The clinical effects are evident 3 to 4 weeks later and their duration depends on dosage. Ten months' alleviation of menopausal symptoms can be obtained by 50 mg. of oestradiol. Progesterone, testosterone, and desoxycorticosterone acetate can be implanted in the same way.

The pellets were produced by hand-pressing 10 to 25 mg. of hormone in a brass-tube box, 2.5 mm. in diameter, with a brass piston. The pellets had a diameter of 2.5 mm. and a thickness of 1 to 3 mm.; they were sterilized by dry heating at 100°C. for 24 hours.

Doreen Daley

1267. Treatment with Oestrogen Implants. (Ensayo sobre terapeutica con pellets de estrogenos.)

By A. Ernst Martinez. Bol. Soc. chil. Obstet. Ginec., 12, 262-272, Oct. 1947. 14 figs., 6 refs.

1268. A Clinical Evaluation of Dienestrol, a Synthetic Estrogen.

By A. E. RAKOFF, K. E. PASHKIS, and A. CANTAROW. J. clin. Endocrinol., 7, 688-700, Oct. 1947.

The authors present the results of a clinical study on the synthetic oestrogen, dienoestrol (4,4'-dihydroxy-γ-δ-diphenyl-β,δ-hexadiene). The objects were to determine the relative usefulness of dienoestrol in oestrogen therapy, to evaluate the oestrogenic response, and to determine possible toxic effects.

Dienoestrol was given in gradually increasing dosage to 40 patients with menopausal symptoms. Slightly over half the patients required a daily dose of 0.5 mg. to control symptoms, but mild symptoms in all cases and moderate symptoms in onethird of the cases could be controlled with o.i to 0.3 mg. daily. In 10 per cent 1 mg. was required to control symptoms. The dose needed to obtain a vaginal-smear response was greater than that required to control symptoms. For the treatment of atrophic vaginitis, doses of up to 3 mg. daily were needed, but excellent results were obtained with the local application of a vaginal cream containing dienoestrol. Daily application of 0.5 mg. gave a good clinical and vaginal-smear response in I week. Bleeding during treatment or on withdrawal was unusual. Inhibition of lactation was successfully accomplished in 26 women, with a dose of 0.5 mg. twice daily for 3 days, followed by o 5 mg. daily for 1 week. Treatment of amenorrhoea in young women was less sucessful; dienoestrol was inferior to stilboestrol for this purpose. In spasmodic dysmenorrhoea and in other conditions, such as cystic mastitis, effects comparable to those of stilboestrol were obtained. There was no clinical or laboratory evidence of toxicity—nausea, vomiting, and headache being absent. No significant effect was noted on the blood or on hepatic or renal function in patients receiving treatment for prolonged periods, in some cases as long as 16 months.

Dienoestrol seems to be particularly effective in controlling the vasomotor and related symptoms of the menopause and for the inhibition of lactation. The explanation for this is probably that dienoestrol has a relatively marked inhibitory effect on the anterior pituitary, while stilboestrol acts more on the endometrium and vaginal mucosa. Dienoestrol is unique in that its oral potency is as great as, if not greater than, its potency by injection. The action is not prolonged, experimental oestrus in mice and rats lasting on an average for about 3 days. Dienoestrol is one of the best tolerated of all the synthetic oestrogens, and is now available as a relatively inexpensive product.

[A certain amount of work had already been done on dienoestrol, but further detailed studies were needed, and the present work is a valuable contribution. Dienoestrol has been found by British workers to be relatively ineffective in inducing withdrawal bleeding from the endometrium, compared with stilboestrol. The best results in the treatment of carcinoma of the prostate and elsewhere have been obtained with stilboestrol. That dienoestrol acts more as a pituitary inhibitor than directly on the endometrium may be the correct explanation. This work confirms previous opinions on the value of dienoestrol in two conditions in which inhibition of the anterior pituitary is to be preferred to a direct effect on the endometriummenopausal symptoms, believed by many to be due to excess of pituitary gonadotrophic hormone, and the inhibition of lactation. The absence of toxicity when dienoestrol is used for menopausal symptoms is of great value. It seems likely that different uses will eventually be found for the various synthetic oestrogens.]

Josephine Barnes

1269. Treatment by Male Sex Hormone and Luteal Hormone of Premenopausal Hormonal Disturbances. (Les troubles hormonaux d'origine préménopausique. Leur traitemente par l'hormone mâle et l'hormone du corps jaune.)

By C. Beclere and H. Simonnet. Rev. Ginec.

Obstet., 42, 191-201, Mar. 1948. 11 refs.

1270. Menopausal Bleeding. (Blutungen in der Menopause.)

By H. Husslein. Klin. Med. Wien., 3, 86-93, Feb. 1, 1948. 6 refs.

By L. A. DAY and J. H. PRATT. Proc. Mayo Clin., 23, 162-166, Mar. 31, 1948. I fig., 8 refs.

1272. Haemorrhages After the Climacteric, Due to Hormone-producing Tumours. (Metrorrhagi efter Klimakteriet som Følge af hormonproducerende Ovarietumorer.)

By A. LACHMAN. *Ugeskr. Læg.*, 110, 436-438, Apr. 8, 1948. 3 refs.

1273. Male Blood Transfusion in Functional Uterine Haemorrhage. (La transfusión de sangre masculina en las metropatias hemorrágicas funcionales.)

By U. Matera. Obstet. Ginec. lat.-amer., 5,

304-312, July 1947. 12 refs.

Functional uterine haemorrhage can be effectively treated with progesterone and the androgens, but these hormones are expensive. Curettage is dangerous in patients with full genital activity. [No evidence is presented in support of this statement.] The author has therefore treated a series of 15 cases by transfusions of male blood, with the objects of supplying the male hormone and thus helping to control the hormonal balance, and of treating the anaemia. The ages of the patients ranged between 14 and 49, and total amounts of between 250 and 1,700 ml. were given, the number of transfusions varying between 1 and 8. Results were good, with restoration of a normal menstrual cycle.

[Only the immediate results are detailed, although the late results are said to have been satisfactory. No mention is made of Rh testing, which is desirable in all cases and essential in young patients and when multiple transfusions are given.]

Bryan Williams

1274. Uterine Bleeding with Special Reference to the Functional Type.

By E. Novak. J. int. Coll. Surg., 11, 9-16, Jan.-Feb., 1948.

1275. Radiotherapy of Metropathias. By P. R. RAU. Indian J. Radiol., 2, 30-34, Feb.

1948. 2 figs.

Sterility.

1276. Sterility.

By R. M. Brannon. Sth Surg., 14, 195-201, Mar. 1948.

1277. What Do We Know About Sterility?
By L. W. MASON. West. J. Surg., 65, 119-123, Feb. 1948.

1278. The Tubal Factor in Sterility. (El factor tubario en la esterilidad.)

By A. Alvarez Bravo. Rev. méd. Hosp. gen.,

9, 845-862, Aug. 1947. 32 figs., 22 refs.

In a series of 388 cases of sterility investigated in Mexico, tubal factors alone were found to be responsible in 68 cases and in combination with other factors in 94 cases. Infection is the most important cause. Genital tuberculosis always involves the Fallopian tubes. In a previous series of cases the author found that a puerperal infection was the cause in 21 per cent of cases of sterility, and that a postabortion infection was more dangerous than a postpartum infection. The gonococcus is the most important organism causing sterility. Insufflation with a kymographic apparatus should be the routine method of investigation when other factors have been excluded, and is valuable in demonstrating tubal contractility. Hysterosalpingography is [A series of good kymographic also necessary. tracings and hysterosalpingograms is reproduced.]

Treatment is by hormones and measures directed against infection, such as the use of pelvic heat and diathermy. Insufflation is of great therapeutic value; the author repeats it as often as 10 or 12 times, but does not advise salpingography as a routine method of treatment. Surgical treatment is carried out only if all the other factors are favourable. The various operative measures are described. Salpingolysis is apt to fail, as the adhesions re-form. In salpingostomy by circumcision a sleeve of tube is sutured back. In lateral salpingostomy an opening is made on the side of the Fallopian tube opposite to the mesosalpinx and may be kept open by the use of amniotic membrane. End-to-end anastomosis of the tube over pieces of catgut or a ureteric catheter passed through the uterine cavity into the vagina is a delicate and not very successful operation. Implantation of the Fallopian tube into the uterus may be carried out when there is obstruction at the uterine cornu. The Fallopian tube is divided and separated a little from its mesentery, and a sleeve formed and folded back. A ureteric catheter is then passed into its lumen and later into the uterus. The intersitial portion of the Fallopian tube is removed and a tunnel made into the uterus. The Fallopian tube is then drawn through this by means of the sutures which were used to form the sleeve and were left long; these are passed through

the wall of the uterus and tied, and the peritoneal opening is closed by fine sutures. The ureteric catheter is removed from the vagina between the sixth and tenth days. Implantation of the ovary into the uterus is rarely successful. During operation tubal patency may be tested by the injection of saline or air into the lateral end of the Fallopian tube, or by the injection of saline into the lumen of the uterus, while the lower part of the uterus is compressed. After operation a careful insufflation is carried out on the tenth day, and is repeated monthly in the pre-ovulatory period. Hysterosalpingography is also performed.

The number of cases treated was 119 and the result in 25 of these is unknown. In 36 cases treated by insufflation 7 full-time pregnancies resulted and in 54 treated by insufflation and other measures 22 full-time pregnancies. In 4 cases treated by hysterosalpingography there were 3 full-time pregnancies, in 12 cases receiving surgical treatment 2 full-time pregnancies and in 13 cases treated by other measures 2 full-time pregnancies. Twenty-four live babies were born in 26 full-time pregnancies. There were also 8 abortions and 3 cases of ectopic pregnancy, 2 of which followed surgical treatment; in neither of these was there postoperative insufflation and both followed a first insufflation carried out in the pre-ovulatory stage. Bryan Williams

1279. Conception Following the Prediction of the Day of Ovulation with the Rat Test. A Study of Ten Patients.

By D. P. Murphy and E. J. Farris. Amer. J. Obstet. Gynec., 54, 467-474, Sept. 1947. 3 refs.

This paper is a further evaluation of the rat test for ovulation previously described by one of these authors, and of value in the study of relatively infertile couples. By semen analysis the husband is classified (by criteria as yet to be published) as infertile, of low fertility, or highly fertile. In the absence of previous pregnancy, or laparotomy in the wife, the patency of the Fallopian tubes is determined by uterosalpingography. This is followed by timing of the day of ovulation.

The morning specimen of urine is collected on 10 consecutive days during the middle third of the menstrual cycle, and 2 ml. of urine is injected subcutaneously into each of 2 immature female white rats of the Wistar strain. Each animal is killed by illuminating-gas at the end of 2 hours. The abdomen is opened, the ovaries are drawn one at a time into the wound, and the colour of each is compared with the graded shades of red of the Munsell colour system. In the presence of normal ovulation, the patient's urine induces hyperaemia in the ovaries of the rat on 4 or 5 consecutive days. If ovulation is present but abnormal, hyperaemia is usually not present on 4 consecutive days. Intercourse is prohibited during the testing period of each month, since it adversely affects the colour reaction. No attempt at conception is advised during the first month of study. The authors find

that the ovum is ready for fertilization on the last day of the colour reaction. Intercourse should not take place on the days immediately before that on which the ovum is ready, otherwise the maximum number of spermatozoa will not be available on

that day.

Ten women became pregnant when coitus or artificial insemination took place on the day of ovulation. All but I of these patients had previously had difficulty in conceiving. women, tested in many consecutive months, showed few normal ovulation reactions. emphasizes the need for testing such women every month in order to discover the few times when they may conceive. The rat-ovulation test gives 2 or 3 days' warning of impending ovulation. This fact makes it possible to have the husband conserve his sperm cells for that day. If artificial insemination is intended, the test allows time for preparation and makes for economy when donor specimens are used. The test also renders unnecessary the performance of endometrial biopsy.

The reader unfamiliar with this test will find a more detailed description in Amer. J. Obstet.

Gunec., 1946, 52, 14.]

Anthony W. Purdie

1280. Mucus, Sperm, and Infertility. Studies Concerning Human Cervical Mucus and Sperm Migration in Relation to Infertility.

By A. R. ABARBANEL. J. Mt Sinai Hosp., 14,

729-738, Sept.-Oct. 1947. 2 figs., 20 refs.

In this investigation over 500 women were intensively studied and over 2,500 tests of sperm migration carried out both in vivo (post-coital) and in vitro. The in vitro tests followed the method of Lamar with the author's modification to eliminate the criticism that the bubble of air introduces extraneous factors. The results cover the cyclic changes in the cervical mucus in the normal cycle, and the changes in the cervical mucus in hysterectomized, bilaterally ovariectomized women with an apparently normal cervical stump under artificial stimulation with various hormones, including preparations of oestrin, progesterone, and testosterone.

In the first group the author noted changes in the volume and viscosity of the cervical mucus, beginning about the tenth or eleventh day of the cycle and reaching their climax about the fourteenth day and coinciding with the low point of the basal body temperature, the day of so-called "ovulatory dip" or temperature shift. The volume was seen to increase from twofold to as much as tenfold, with a marked decrease in viscosity; the mucus became glairy, translucent, and almost watery. Leucocytes disappeared. At this stage spermatozoa penetrated and migrated through the mucus easily, and in relatively large numbers. In the post-ovulatory phase (usually within 48 to 72 hours) the volume decreased markedly, the viscosity rapidly increased, and leucocytes returned. By the nineteenth day (5 days after the temperature shift) sperm could no

longer invade the cervical mucus even if placed in direct contact with it for 24 to 48 hours. Menstrual fluid was found to be easily and rapidly penetrated by sperm, which remained active and motile for 24 to 48 hours in it.

In the second group (ovariectomized, hysterectomized women in whom the cervical stump was present) the administration of an active oestrin preparation produced results similar to those obtained in the first group, the time lag between the start of therapy and the production of the typical preovulatory state of affairs ranging from 5 to 14 days. Progesterone when given alone had no effect, nor did testosterone preparations. When oestrin administration was followed by progesterone the results were similar to those in the normal post-

ovulatory phase.

The author concludes that "the essential physiological role of the oestrin-induced pre-ovulatory changes in the cervical mucus is to provide, as W. Tyler Smith stated in 1855, a suitable medium for the passage of spermatozoa through the cervix uteri into the uterine cavity". From the clinical aspect he advises that the Smith-Sims-Huhner test should be carried out on the thirteenth or fourteenth day of a 28- or 30-day cycle. author's practice to perform the test on the eleventh and fourteenth days and again on the seventeenth day if thought necessary, because in many women the time of the temperature shift may vary considerably. Cauterization of the cervix is also advised in cases of endocervicitis, because where infection is present there is a loss of fluid with increased viscosity and consequent decreased or absent sperm penetration. E. L. Nicolson

1281. Semen Evaluation and Fertility.

By E. F. HOFFMAN. West. J. Surg. Obstet. Gynec., 56, 155-156, Mar. 1948.

1282. Infertility Associated with Masculinizing and Feminizing Syndromes.

By S. J. Glass. West. J. Surg. Obstet. Gynec., 56, 116-118, Feb. 1948. 9 refs.

1283. The Importance of Disturbed Function of the Endometrium in the Treatment of Sterility. Investigation of 100 Cases by means of Curettage During Menstruation. (Endometrium functio-zavarok jelentősege a meddőség gyógytásában (100 menses curettage vizsgálata).)

By E. Selmeci. Orvosok Lapja, 4, 67-71, Jan.

18, 1948. 15 refs.

1284. The Basal Temperature Curve in the Investigagation and Treatment of Sterility. (La gráfica de temperatura basal en la investigación y tratamiento de la esterilidad.)

By J. M. SALA PONSATI. Med. esp., 19, 124-130, Jan. 1948. 7 figs., 21 refs.

1285. Treatment of Functional Sterility with Gonadotrophic Hormones. (Behandling af Funktionel Sterilitet med gonadotrope Hormoner.)

By A. E. RYDBERG and V. MADSEN. Ugeskr. Læg., 109, 827-837, Nov. 20, 1947. I fig., 3 refs.

The authors report on the treatment of 52 cases of long-standing "functional"—that is, ovarian sterility with standard courses of gonadotrophic hormone. They divide their cases into two principal types: those in which the sterility is accompanied by disturbances of menstruation, and those in which menstruation is normal. The former are classified as "functional" only if patients conceive within 6 months of treatment. Sixteen such cases are reported, but the total number treated is not stated. In each case the treatment comprised five consecutive daily injections of 3,000 i.u. of serum gonadotrophic hormone, followed by three injections on alternate days of 1,500 i.u. of chorionic gonadotrophic hormone. The immediate result in a typical case was a rise in the urinary oestrin from less than 30 milliequivalents per 24 hours to 450 milliequivalents per day in the space of 2 weeks. During the third week nearly 20 mg. of pregnanediol was excreted per 24 hours, and menstruation occurred 3 weeks after the start of treatment. In 5 cases, conception occurred at once; in the rest, within 6 months. The other type of case (in which there was no disturbance of menstruation) was only classified as "functional" after the exclusion by careful examination of anatomical causes of sterility and of sterility in the male partner. The diagnosis was confirmed if endometrial biopsy at the beginning of menstruation showed the endometrium to be in the proliferative phase or otherwise atypical, or showed the mucous membrane to be atrophic. In the absence of such findings the diagnosis remained unconfirmed until the case responded to treatment. Thirty-six cases of this type were treated, usually with the chorionic gonadotrophic hormone alone, because it was argued that as menstruation was normal the follicles were maturing and the dysfunction must lie in the luteinization process. Treatment was given at the beginning of the second half of the menstrual cycle. In 16 of these cases conception occurred within 6 months (at once in 7 cases and within 10 weeks in a further 7). Delivery took place at the normal time in 6 cases; abortion occurred in 2, and pregnancy is continuing in the remainder.

B. Nordin

1286. Fertility and Salpingograms after Operation on Tubal Pregnancies. (Fertilität und Salpingogramme nach operierten Tubargraviditäten.)

By F. Lemberger. Zbl. Gynäk., 69, 63-69, 1947. Examination of statistics of 5,993 cases of tubal pregnancy showed that a second tubal pregnancy occurred in 8.96 per cent. From another set of statistics of 2,034 cases of tubal pregnancy the author found that 35.3 per cent of patients had a subsequent intrauterine pregnancy. With a view to determining the cause of the low fertility he has followed up the 196 women on whom he operated for tubal pregnancy during 1940-3. Twenty-four

had recurrent tubal pregnancy. He considered 124 of the women still capable of further conception. [How this figure is arrived at is not stated.] Of the 124, 25 have since had an intrauterine pregnancy and 4 a subsequent extrauterine pregnancy. Of the remaining 95 cases 69 were investigated by uterosalpingography. In 20 no "lipiodol" passed out of the uterus; in 13 there was a blockage in the isthmus; in 14 there was a blockage at the ampulla; in 4 the Fallopian tube was clear; in 18 lipiodol passed into the peritoneal cavity. It is possible, therefore, that 18 of these 69 patients may yet become pregnant. Gladvs Dodds

1287. Does Sterility Play a Part in the Aetiology Fibroids? (La stérilité jone-t-elle un rôle dans l'apprecies tion du fibromyome utérin.)

By R. Keller and L. Gioanni. Obstćt., 46, 529-532, 1947.

Forty years ago sterility was thought to be factor favouring the appearance of uterine fibroid but to-day most gynaecologists do not agree with that view. The authors have reconsidered the question against the background of what they term gravid inactivity" of the uterus. They have noted an average of at least 10 years between the detection of a fibroid and the last pregnancy. In an analysis of 249 cases they establish the fact that most fibroids have developed during the period of sexual activity—the few post-menopausal cases being usually associated with ovarian tumours showing hyperfolliculism. Their analysis indicated that of 249 women 230 still menstruated when the fibroid was discovered; in the other cases the fibroid was found shortly after the menopause and could be presumed to have existed at the time of menstruation. They analyze the degree of parity and note that there were 76 (30 per cent) null parons women, and 173 (70 per cent) who had born children. The analysis of the latter group, however, showed that 131 had at least a 10-year interval since the last pregnancy, and if to this is added those cases discovered during pregnancy with an equally long interval since the previous pregnancy, a final total is obtained of 93.6 per cent of cases. They confirm these figures by finding that 72 per cent had a 15-year interval. The authors consider this conclusive evidence that the factor concerned is the "gravid inactivity" of the uterus for at least 10 years before the discovery of the fibroid. In all these cases the predisposing factor is the fact that the uterus has not functioned in the gravid state. As regards the argument that the fibroid may

itself be the cause of the inactivity of the uterus, they note that most fibroids are found later in life, whereas the first pregnancy occurred before the age of 30; moreover, in many cases the sterility has been found to be due to the husband or to contraceptive methods. They conclude that "the fibroid is by itself a rare cause of sterility".

B. Sandler

1288. Artificial Insemination. (Artificiel insemination.)

By A. Westman. *Nord. Med.*, 37, 397-399, Feb. 27, 1948.

Abnormalities of the Reproductive Organs.

1289. The Syndrome of Congenitally Aplastic Ovaries with Sexual Infantilism, High Urinary Gonadotropins, Short Stature and other Congenital Abnormalities. Tabular Presentation of Twenty-five Previously Unpublished Cases.

By H. LISSER, L. E. CURTIS, R. F. ESCAMILLA, and M.B. GOLDBERG. J. clin. Endocrinol., 7, 665-

687, Oct. 1947. 9 figs., 9 refs.

Twenty-five cases of the syndrome of ovarian aplasia are described. Of these, 6 were investigated by laparotomy or peritoneoscopy and confirmed. The urinary excretion of gonadotrophin was examined in 15 cases; in 11 of these the excretion was over 150 mouse units, the normal for adult menstruating females being from 10 to 50 and for children o to 5 mouse units. In 9 cases the diagnosis was based on primary amenorrhoea in association with infantilism and short stature with stocky build. The height of the patients exceeded 145 cm. in 5 cases only. These are regarded as presumptive cases, whereas the others are considered to be confirmed either by laparotomy or by the finding of a high gonadotrophin excretion. The syndrome must be distinguished from pituitary infantilism, in which the excretion of gonadotrophin is low, and from eunuchoidism originating in childhood, in which growth is not retarded and the limbs are disproportionately long. Treatment with oestrogens was successful; there was adequate mammary development and growth of sexual hair and of the external and internal genitalia, except for the absent ovaries. Regular withdrawal menstruation was also achieved.

H. Herxheimer

1290. Uterus Didelphys.

By J. S. Galang. *J. Philippine med. Ass.*, 34, 89-91, Feb. 1948. 2 refs.

1291. Vesicovaginal Fistula.

By J. E. BELLAS. *Illinois med. J.*, 93, 138-143, Mar. 1948. 3 figs., 2 refs.

1292. Vulvar Synechia in a Child. (Synéchie de la vulve d'enfant.)

By K. Vesely. Ann. paediatr., Basel, 170, 151-161, Mar. 1948. 4 figs., 6 refs.

1293. Social and Psychological Readjustment of a Pseudohermaphrodite Under Endocrine Therapy.

By R. S. FINKLER. *J. clin. Endocrinol.*, **8**, 88-96, Jan. 1948. 4 figs., 8 refs.

Infections of the Reproductive Organs.

1294. Ultraviolet Blood Irradiation Treatment of Pelvic Cellulitis. Knott Method.

By R. C. Olney. *Amer. J. Surg.*, **74**, 440-443, Oct. 1947. 32 refs.

The usual methods of treatment of pelvic L

cellulitis and pelvic inflammatory disease aim at destroying the infecting organism, and neglect to increase the resistance of the host. The latter can be achieved by ultraviolet blood irradiation by the Knott technique, in which the blood oxygen is increased up to 300 per cent and the phagocytic action of the white cells by 50 to 100 per cent. The treatments are given at intervals of 2 to 4 weeks, and 2 to 6 treatments, sometimes more, are required. In chronic cases they are given at intervals of 1 month, 2 months, or 3 months. The author has treated 631 patients since 1944. Almost all massive inflammatory lesions will subside completely without surgical intervention. Many of the patients had massive inflammatory lesions which had persisted for years in spite of other treatment. In most of them swelling and tenderness disappeared in 4 to 8 weeks. Another interesting group consisted of 174 women, many of them single, who had tender and painful pelvic organs with dysmenorrhoea but no palpable swellings. Of these, 87 per cent were entirely relieved of all symptoms. During 25 years of practice the author has never found any treatment for chronic pelvic cellulitis that compares with this.

F. J. Browne

1295. Pelvic Inflammatory Lesions in the Female and Diathermy. (Inflammazione dei genitali interni femminili e diatermia.)

By T. M. CAFFARATTO. Gazz. med. ital., 107,

9-17, Jan. 1948. 2 figs.

1296. Preliminary Report. A—Contact Testing of the Vagina with Vaginal Suppositories containing Penicillin. B—The Therapeutic use in Dermatology of Vaginal and Rectal Suppositories containing Penicillin.

By L. GOLDMAN and M. D. FELDMAN. J. invest.

Derm., 9, 155-156, Sept. 1947. I fig.

This preliminary study included 30 in-patients and out-patients, 19 with skin disease and 11 others. Suppositories containing 100,000 units of penicillinin a base consisting of cocoa butter, a small amount of bismuth subcarbonate, and enough beeswax for firmness were used for an average period of one week. The therapeutic effect seemed to be good in all cases except one, and it appeared that penicillin may be absorbed readily from both rectal and vaginal suppositories. Attempts were made to perform patch tests on the vaginal mucosa in 5 patients; no local reaction was seen.

E. W. Prosser Thomas

1297. The Treatment of Vaginitis with Penicillin Vaginal Suppositories.

By S. Abel and C. J. Farmer. Quart. Bull. Nthwest. Univ. med. Sch., 22, 5-9, Spring Quarter 1948. 3 refs.

1298. Vaginal and Rectal Pruritus—Etiology and Treatment.

By E. L. CORNELL. Amer. J. Obstet. Gynec., 55, 691-698, Apr. 1948.

1299. A Study of Cervical Cultures Taken in Cases of Acute Gonorrhea with Special Reference to the Phases of the Menstrual Cycle.

By M. L. Koch. Amer. J. Obstet. Gynec., 54,

861-866, Nov. 1947. 2 figs. 7 refs.

The difficulty of obtaining positive cultures from patients having the clinical picture of acute gonorrhoea has for long been blamed on the cultural characters of the gonococcus. A preliminary investigation, however, showed that the percentage of positive cultures in such cases varied with the time they were taken in relation to the menstrual cycle. Fifty patients suspected of having acute gonorrhoea and with normal cycles were examined for the presence of gonococci in the cervix at different times in the cycle, and the pH of cervical mucus was determined. When the acidity was highest (pH 5.8 to 6.2), often between the twenty-second and twenty-fifth days of the cycle, all swabs were negative for gonococci. At the more favourable hydrogen ion concentrations of 6.8 to 7.5 found early in the cycle (first to eleventh day) some 8r per cent were positive, and the proportion varied between these limits.

D. M. Stern

1300. Syphilitic Chancre of the Cervix. (El chancro sifilítico del cuello uterino.)

By E. De GREGORIO. Med. clin., 10, 158-167, Mar. 1948. 7 figs., 12 refs.

1301. Trichomoniasis — The Seventh Venereal Disease.

By L. F. Freed. S. Afr. med. J., 22, 223-229, Mar. 27, 1948. 55 refs.

1302. Treatment of Trichomonas Vaginitis by Phenylmercuric Borate. (Le traitement de la vaginite à trichomonas par le Merfen.)

By E. WITZIG and J. CHATILLON. Praxis, 37,

227-229, Apr. 1948. 27 refs.

1303. Urethro-vaginal Fistula and Urogenital Atresia due to Lymphogranuloma Venereum. (Fistula uretro-vaginal y atresia urogenital linfogranulomatosas.)

By S. FUENZALIDA and R. VARGAS ZALAZAR. Bol. Soc. chil. Obstet. Ginec., 12, 186-188, Aug. 1947.

2 figs., 6 refs.

1304. Combined Fever- and Sulphathiazole-Treatment of Salpingitis. (Kombineret feber- og sulfatiazolbehandlung af salpingitis.)

By N. BLIXENKRONE-MØLLER and P. Schou. Nord. Med., 37, 408-409, Feb. 27, 1948. 5 refs.

1305. Ovarian Abscess. (Het ovariumabsces.) By T. J. VAN SANTE. Ned. Tijdschr. Geneesk., 92, 1227-1234, Apr. 24, 1948.

1306. The Clinical Significance of Chronic Parametritis.

By C. F. Fluhmann. California Med., 68, 159-161, Mar. 1948. 7 refs.

1307. Psychic Disturbances in Inflammations of the Adnexa. (Les troubles psychiques au cours des annexites.)

By A. LAFFONT, M. BONAFOS, and R. GARÈS. Gynéc. et Obstét., 46, 666-676, 1947. 18 refs.

1308. Bacteriological and Histological Diagnosis of Adnexal Tuberculosis. (Zur bakteriologischen und histologischen Diagnose der Adnextuberkulose.)

By E. Held. Gynaecologia, Basel, 125, 56-60, Jan.-Feb. 1948.

1309. Tuberculosis of the Cervix. (Tuberculosis del cuello de utero.)

By N. Arenas, O. Blanchard, and J. C. Lazcano Gonzalez. Rev. Ginec. Obstet., 1, 128-141, Feb. 1948. 6 figs., 48 refs.

New Growths of the Reproductive Organs.

1310. Pelvic Cancer Delay.

By J. Y. Howson. Amer. J. Obstet. Gynec., 55, 538-540, Mar. 1948.

1311. Multiple Pelvic Malignancies.

By W. H. HILL and W. R. GLENN. Sth Surg., 14, 192-194, Mar. 1948. 3 refs.

1312. Relief of Pain in Intractable Cancer of the Pelvis.

By M. Kenny. Brit. med. J., 2, 862-863, Nov.

29, 1947.

Caudal injection of "proctocaine" has been used for the relief of pain in 18 cases of intractable cancer of the pelvic organs (uterus, bladder, prostate, and vagina) at the British Post-Graduate Medical School. The procedure is simple, can be carried out by those without special surgical skill, and may be repeated if required.

The patient is placed in the left lateral position, and the skin over the sacral hiatus is infiltrated with 5 ml. of 1.5 per cent procaine. A 3-in. (7.5 cm.) record needle (bore 2) is inserted, and after penetrating the fibrous membrane is pushed into the sacral canal for a further inch (2.5 cm.). No blood or cerebrospinal fluid should be obtained. After a preliminary injection of 5 ml. of 1.5 per cent procaine to ensure that the injection is being made within the sacral canal, 40 to 60 ml. of warm proctocaine is injected slowly, until pain is relieved or until the level of skin anaesthesia reaches the Ten minutes are usually line of the nipple. required for the injection. If pain is not immediately relieved it may disappear only when the patient lies on the right side, or stands up, or lies on his back with the foot of the bed raised. The injection may be repeated in a few weeks if the pain returns.

In the series results were satisfactory in 13 cases, pain being relieved by 1 to 3 injections for a period of 3 weeks to 4 months. In 1 case 5 ml. of absolute alcohol was added to the proctocaine at the second injection. In 4 cases results were unsatisfactory, because painful metastases developed elsewhere,

There were no cases of urinary or faecal incontinence, unfortunate sequelae sometimes noted after intrathecal injection of alcohol. One patient died shortly after caudal injection had been started, under thiopentone anaesthesia necessitated by the severity of the pain. Permission for necropsy was refused, and oil embolism could not therefore be excluded as a cause of death.

Ian T. Fraser

1313. Aspiration Curettage of the Endometrium in a Cancer Clinic. An Analysis of 200 Cases.

By G. A. WILLIAMS and C. B. STEWART. Amer. I. Obstet. Gynec., 54, 804-808, Nov. 1947. 4 refs.

In a busy cancer clinic many women are investigated for vaginal bleeding or discharge in whom no abnormality is found. Careful and repeated investigation is required in these patients, who do not always consent to operative measures under anaesthesia. The authors believe that there is a definite place in these cases for aspiration curettage of the endometrium. A size 12 metal male catheter is used, carrying on the convex surface of its shortened beak a knife-edged fenestrum. The uterine cavity is explored for irregularities of the surface and then the fenestrum is applied firmly to one border. When suction is applied the beak of the catheter methodically explores the entire surface. A volsellum is used to steady the cervix if it is unduly mobile. Curettings are ejected into normal saline solution. The result of the investigation of 200 cases is well summarized in the following tables.

Initial Pathologic Diagnoses in Aspiration Curettings

Initial Diagnosis	Pre- Menopausal	Post- Menopausal	Total
Number of Patients	142	58	200
Insufficient tissue	15	9	24
Proliferative	21	3	24
Mixed proliferative and	đ		•
secretory	I		1
Secretory	22		22
Hyperplastic	61	, 8	69
Atrophic	_	13	13
Chronic endometritis, undetermined	3	2	5
Chronic endometritis, fibromyoma	5	2	7
Chronic endometritis, polyps Chronic endometritis,	2	2	4
puerperal Cervical polyp, pre-	7		7
cancerous Adenocarcinoma of	1	1	2
endometrium Adenocanthoma of	2	16	18
endometrium Epidermoid carcinoma		I	1
of cervix Adenocarcinoma of	I	I	2
cervix	<u> </u>		I

Final Diagnoses in Group with "Unsatisfactory"
Aspiration Curettage Diagnoses

	Before Meno- pause	1	After Menopau	se
Final Diagnosis	Insuffi- cient Tissue	Insuffi- cient Tissue	Atro- phic	Chronic Endo- metritis
Atrophic vaginitis		2	3	
Carcinoma of cervix	1	I		
Carcinoma of endo-				*
metrium		1		
Cervical polyp			3	
Oestrogen withdrawal		I		-
Fibromyomata uteri	5	I	4	
Fibrosis uteri	ī			-
Hyperplasia of endo-				
metrium	2			
Arterial hypertension		1	3	
Stricture of cervix,			_	
benign				1
Diagnosis not deter-				
mined	6	3		1

# Aspiration Diagnoses Checked by "Surgical" Diagnoses

Surgical diagnosis in full agreement ... ... 26
Surgical diagnosis in partial agreement ... 2
Surgical diagnosis in positive agreement ... 2
Surgical diagnosis in negative disagreement 5
Total cases checked without preoperative radiation ... ... ... ... ... 35

G. Gordon Lennon

1314. The Endocrine Factors in Pelvic Tumors, with a Discussion of the Papanicolaou Smear Method for Diagnosis.

By A. E. Rakoff. *Radiology*, **50**, 190-201, Feb. 1948. 9 figs., 20 refs.

1315. The Importance of Diagnostic Aspiration through the Vaginal Vault. (A huvelyboltozati szurcsapolas jelentősége.)

By M. Acs. Orvosok Lapja, 4, 141-145, Feb. 1, 1948. 8 refs.

1316. Further Observations with Intravaginal Roentgen Therapy of Cancer of the Female Pelvis.

By W. W. Wasson and R. Greening. Radiology, 49, 452-461, Oct. 1947. 10 figs., 3 refs.

This paper emphasizes that Stage I cancer of the cervix can be cured by either surgery or the various forms of irradiation, while failure occurs in the second, third, and fourth stages. The method of irradiation is described, and certain procedures are suggested which hold out hope of better results. The anatomical structures involved in cancer of the cervix lie within the birth canal. Examination to determine the exact tissues involved by growth should be carefully carried out, a point often over-

looked because the disease is so frank and apparent. Type, grade, and extent must be determined. External irradiation should be standard in all except Stage 1 tumours, a dose of 2,500 r being delivered to the tumour area in a few weeks. As the contour is not uniform a perineal field should be used in order to raise the dose to the lateral lymph nodes. As at least 4,000 r must be delivered to destroy cancer, the extra 1,500 r is delivered through intravaginal cones. If the sum of the diameters of the areas treated equals that of the birth canal then radium must be used inside the uterus to complement the X-ray therapy. should always be employed in Stages 2, 3, and 4. By these means a tumour dose of 5,000 r can be delivered in the birth canal, but this can never be repeated. The authors point out that intravaginal X-ray therapy can be used after operations on the uterus and ovaries, or on caecum, bladder, and I. G. Williams rectum.

1317. Some Little-known Applications of X-ray Therapy in Gynaecology. (Su alcune applicazioni meno note della roentgenterapia ginecologica.)

By E. Robecchi. Gazz. med. ital., 107, 17-20, Jan. 1948.

1318. Behaviour of the Erythrocyte Sedimentation Rate in Cases of Malignant Tumours of the Female Genital System Treated by Radium and X-ray Therapy. (Comportamento della velocità di sedimentazione in donne affette da tumori maligni dell'apparato genitale sottoposte a radium- e roentgen-terapia.)

By T. TAVANO. Gazz. med. ital., 107, 21, Jan. 1948.

1319. The Treatment of Cancer of the Female Genitals by Irradiation. (Lécba rakoviny zenskych rodidel zárenim.)

By K. HAVRANEK. Léh. Listy, 3, 212-217, Apr 15, 1948. 20 refs.

1320. The Treatment of Carcinoma of the Vulva. By J. L. McKelvey. Amer. J. Obstet. Gynec., 54, 626-635, Oct. 1947. 7 refs.

The author adopted radical vulvectomy as a standard treatment for carcinoma of the vulva and compares the results obtained before and after this

decision.

Two groups of cases are recorded—32 treated by various means before 1938 and 38 by radical vulvectomy since 1938. In the first group operation resulted in a primary mortality of 6 per cent, and only 5 were alive without recurrence, an absolute cure rate of 13.9 per cent. In the later group there were 4 deaths—a primary mortality rate of 10 per cent. Four patients are alive and free from recurrence after 5 years and 18 are alive without recurrence for periods varying from 2 to 59 months. It is therefore too early to assess the ultimate 5-year cure rate, but the improvement is undoubtedly significant. The author claims an operability rate of 90 per cent, and carries out a

wide excision under local analgesia; simultaneous dissection of the inguinal lymph nodes and fat are performed by the operator and his assistant, and wide excision is essential. Skin defects are allowed to granulate, and later are covered with pinch grafts. Breaking down of the wound is frequent, and cannot be avoided by any known procedure. The author believes that X-ray therapy is of little value in effecting a cure and is useless as a palliative measure, and he rightly opposes removal of inguinal lymph nodes for biopsy as these lymph nodes must be removed later in any case. He recommends getting these patients up as early as possible after operation, particularly the elderly.

E. D. Grasby

1321. Bartholin Cyst. A Simple Method for its Restoration to Function.

By J. W. Davies. Surg. Gynec. Obstet, 86, 329-331, Mar. 1948. 2 figs., 2 refs.

1322. Primary Carcinoma of Bartholin's Gland.

By R. J. CROSSEN. Amer. J. Surg., 75, 597-600, Apr. 1948. 2 figs., 6 refs.

1323. Mesodermal Mixed Tumor of the Vagina: Report of Case.

By G. H. Murphy and J. W. Dushane. Amer. J. Obstet. Gynec., 55, 527-532, Mar. 1948. 4 figs., 18 refs.

1324. Rare Forms of Uterine Tumour. (Zur Kasuistik seltener Geschwulstformen des Uterus.)

By J. Gosch. Z. Geburtsh. Gynäk., 129, 103-106, 1948. 2 figs., 7 refs.

1325. The Etiology of Fibromyomata of the Uterus. Part I: A Review of the Literature and Preliminary Comments on the Hartman-Littrell Technique of Assay.

By J. P. Martin. J. nat. med. Ass., 40, 49-58, Mar. 1948. Bibliography

1326. The Autonomic Nervous System in Patients with Uterine Fibroids. (L'orientamento neurovegetativo della portatrice di fibroma uterino.)

By V. GIRARDI and V. RINDI. Mon. ostet.-ginec., 18, 306-328, July-Dec. 1947. 28 refs.

1327. Lymphoangiocystofibroma of the Uterus. (Das Lymphangiocystofibroma uteri.)

By H. B. Lang. Wien. med. Wschr., 98, 117-119, Mar. 20, 1948. 17 refs.

1328. Treatment of Fibroids by Radium. (Tratamiento de los fibromas uterinos por el radio.)

By M. T. F. DE GAUDINO. An. Med. Cirug., 23, 23-28, Jan. 1948.

1329. Treatment of Uterine Fibroids. (Tratamento dos fibromas uterinos.)

By P. Brocq. Rev. brasil. Cir., 16, 27-40, Dec. 1947.

1330. Treatment of Uterine Fibroids. (Traitement des fibromes utérins.)

By P. Brocq. Gynécologie, 44, 221-246, Sept.-Oct. 1947. 1331. Carcinoma and Uterine Fibromyomas. By F. H. Falls. J. int. Coll. Surg., 11, 24-28, Jan.-Feb. 1948.

1332. The Early Diagnosis of Uterine Malignancy. By T. L. Lee and H. F. Fuller. N. Carolina med. J., 9, 9-11, Jan. 1948. 4 refs.

1333. The Use of Vaginal Smears in the Diagnosis of Genital Cancer.

By J. R. KERNODLE, W. K. CUYLER, and W. L. THOMAS. N. Carolina med. J., 9, 11-17, Jan. 1948. 3 figs., 15 refs.

1334. Clinical Features of Sarcoma of the Uterus. (Zur Klinik des Uterussarkoms.)

By K. Richter. Krebsarzt, 3, 91-101, Mar. 1948. 7 refs.

1335. Simultaneous Carcinomata of Uterus and Ovary. (Les cancers simultanés de l'utérus et de l'ovaire.)

By P. Funck-Brentano and H. Robert. Gynéc. et Obstét., 47, 5-26, 1948. 2 figs. Bibliography.

1336. Results of Treatment of Carcinoma of the Body of the Uterus.

By E. T. BRADLEY. Connecticut med. J., 12, 112-113, Feb. 1948.

1337. Radiotherapy of Uterine Carcinoma in Three North American Institutions. (Radioterapia del cancro uterino in tre Istituti Nord-Americani.)

By G. VALLE. Gazz. med. ital., 107, 22-28, Jan.

1948.

1338. Carcinoma of the Cervix in an Urban Population.

By A. W. DIDDLE and T. R. BENNETT. Amer. J. Obstet Gynec., 55, 669-675, Apr. 1948. 18 refs.

1339. Carcinoma of the Cervix Complicating Procidentia Uteri.

By D. L. Ashton. Amer. J. Obstet. Gynec., 55, 299-302, Feb. 1948. 12 refs.

1340. Anaplastic Cervical Epithelium. Relationship to Cervical Carcinoma.

By C. T. ASHWORTH and A. W. DIDDLE. Sth med. J., 41, 217-221, Mar. 1948. 3 figs., 11 refs.

1341. Impressions of the Vaginal Smear Technic in the Diagnosis of Cervical Cancer.

By L. C. Posey and J. A. Cunningham. Sth med. J., 41, 221-228, Mar. 1948. 5 figs., 10 refs.

1342. Diagnosis and Treatment of Carcinoma of the Cervix. (Diagnostico y conducta terapéutica en el cáncer del cuello uterino.)

By J. M. BEDOYA. *Med. colon.*, 11, 119-132, Mar. I, 1948.

1343. Five-year End-results in the Treatment of Carcinoma of the Uterine Cervix.

By E. L. Jenkinson, E. L. Pirkey, and F. J. Hamernik. Radiology, 49, 415-418, Oct. 1947.

The 5-year results in 95 unselected cases of carcinoma of the uterine cervix treated from 1934 to 1941 inclusive are analyzed; of these only 75 were actually followed up; 55 patients are known to be dead and 18 alive. In Stages 1 and 2, 77 and 87.5 per cent respectively survived for 5 years free from disease, while in Stages 3 and 4 the figures were 26.6 and 3.5 per cent. Analysis of a small number of cases treated with different filtrations and voltages shows much better results with the heavier filtration. Three out of 5 patients who received contact therapy were alive and well 5 years later. [Even in this small series the high percentage of survivals in Stages 1 and 2 and the low percentage in Stages 3 and 4 are striking. The authors ask why more patients are not seen in the early stages. The fault may be with the patient because of lack of education, or with the medical profession.] I. G. Williams

1344. The Significance of Fractional X-ray Therapy (Prolonged Irradiation) in the Treatment of Advanced Carcinoma of the Cervix. (Die Bedeutung der fraktionierten Röntgentherapie (Langzeitbestrahlung) in der Bekämpfung des progressen Carcinoma colli uteri.)

By R. SHREDER and H. KIRCHHOFF. Zbl.

Gynäk., 69, 114-125, 1947. 4 figs., 6 refs.

The treatment and late results are reported in 501 cases of carcinoma of the cervix; 186 (36.9 per cent) patients were well with no evidence of

carcinoma 5 years later.

The clinical classification was:— Group I: well-localized carcinoma, 21 cases; Group II: carcinoma more extensive but still localized to the cervix; parametrium not involved, 260 cases; Group III: infiltration of parametrium around the cervix, 130 cases; Group IV: infiltration of parametrium as far out as the wall of the pelvis, 58 cases; Group V: (a) isolated metastases, or bladder and/or rectal fistula, 26 cases; (b) patients who refused treatment, 6 cases.

Of the patients in Groups I and II, 149 had either a Wertheim or a Schauta operation. The immediate mortality was 18 (12.1 per cent); 86 (57.7 per cent) were alive and free from carcinoma 5 years later. In Groups I and II 132 patients were treated by radium-7 also had a course of deep The immediate mortality was X-ray therapy. 7 (5.3 per cent). The 5-year cure rate was 44 per cent. Of the Group III patients 15 had either a Wertheim or a Schauta operation. The immediate mortality rate was 13.3 per cent and the 5-year cure rate 20 per cent. In Group III, 115 patients were treated by radium-22 also had deep X-ray therapy. The immediate mortality rate was 5.2 per cent and the 5-year cure rate 24.3 per cent.

The most interesting part of this report concerns the 58 patients in Group IV, 54 of whom were treated by X-ray therapy only—2 died within 2 months after the first treatment, I from uraemia and I from haemorrhage; 29 showed no improvement from treatment; 7 improved but carcinoma was present after I year; and 2 died of intercurrent

diseases with no sign of carcinoma. One patient was free from recurrence for 5 years, but lymphnode metastases then developed; 13 patients were free from recurrence for 5 years or longer. Thus 16 out of 54 patients in Group IV were free from recurrence for 5 years or longer. Histological examination of the carcinoma was carried out in every case.

Kirchoff discusses X-ray treatment and refers to the successful results obtained by Coutard in the treatment of carcinoma of the larynx by fractional doses and prolonged treatment. Prolonged treatment with small doses is not suitable in cases of advanced carcinoma of the cervix, as the patients are usually debilitated and cachectic. Kirchoff, by irradiation of dogs' testes showed that there was no need for prolonged intervals between doses. He also increased the dose from 200-250 r to 380-400 r as the tumour in the pelvis was at a greater depth from the surface than a laryngeal tumour. A further point of difference from the Coutard method was that a crossfire method was used instead of homogeneous treatment of greater fields.

Fields irradiated were the abdomen, right and left; back, right and left; vulva; sides, right and left. Size of field was 10×15 cm., skin-focus distance 40 cm.; a filter of 1 mm. copper was used with a current of 180 kV and 4 mA. Each skin field received 400 r, two fields being irradiated daily. The vulva was given 3 or 4 treatments (1,200 or 1,600 r), and all the other fields received 8 to 10 (3,200 to 4,000 r).

Fifteen patients complained of headache, nausea, and marked exhaustion during treatment; 22 had severe and 12 slight intestinal symptoms. Pyrexia occurred during the treatment in 23 cases; in 6 it was marked. Oedema of the skin and exfoliative dermatitis were rare. The best results were obtained in cases treated by the Coutard method only. Cases previously treated by radium did not respond so well. Where the disease extended to the wall of the pelvis the results of treatment were not very good.

Gladys Dodds

1345. Transvaginal Roentgen Therapy in Carcinoma of the Cervix.

By J. A. DEL REGATO. *Radiology*, 49, 413-414, Oct. 1947. 3 figs.

Whatever the means of internal irradiation treatment in carcinoma of the cervix, it constitutes only a complement to external irradiation, and results will depend upon the adequacy of external irradiation, which should precede the internal phase of treatment. The author uses a transparent-walled vaginal speculum to allow the field to open to about 6 cm. at the level of the cervix and so irradiate cervix, fornices, and adjacent parametria. With the patient in the lithotomy position the widest possible speculum is used. Physical factors are 140 kV, 0.5 mm. Cu filter, 25 cm. skin-focus distance, 3,000 to 4,000 r (air) being delivered in 14 days. Advantages are that it completes the external irradiation without trauma and assures a

more homogeneous irradiation, that patients need not be admitted to hospital, and that it can be sufficiently protracted to reduce to a minimum the untoward effects of irradiation. Of 52 unselected patients 22 are alive and well at the end of 3 years.

I. G. Williams

1346. Intracavitary Radium Therapy for Carcinoma of the Uterine Cervix.

By H. H. Bowling. *Radiology*, 49, 406-410, Oct. 1947. 3 refs.

For 30 years radiologists at the Mayo Clinic have used a constant method of intracavitary radium therapy for carcinoma of the cervix uteri. A standard 50-mg, radium applicator is used and inserted at intervals spread over 21 days. The treatment area is divided into zones, the dose in each zone being: vaginal, 2,100 mg.-hours; proximal cervical, 1,400 mg.-hours; distal cervical, 1,400 mg.hours; intrauterine, 2,000 to 2,400 mg.-hours. All applications are made with the patient in the kneechest position, because this allows easier visual examination and palpation, selection of the site of biopsy, and more accurate placing of the radium. Supplementary external X-ray therapy is given to the parametria through two anterior and two posterior fields.

Years	Patients	Patients	Alive 3 Years	
	Treated	Followed-up	and Over	
1915-19	288	264	38 (14.4%)	
1920-24	556	522	185 (35.4%)	
1925-29	647	585	250 (42.7%)	

When classified in stages the results in 1,079 patients where the disease had not been modified by previous treatment were:

Stage	Patients Treated	Patients Followed-up	Patients Alive
1	13	13	9 (69.2%)
2	85	78	47 (60.2%)
3	825	753	224 (29.7%)
4	156	138	9 (6.5%)

Of 565 patients who received a complete course of treatment 52.9 per cent lived 3 years or more, while of 739 patients who received a limited course only 21.4 per cent lived for 3 years or more. Morbidity figures are not available, but the author was not impressed by the number and severity of reactions.

I. G. Williams

1347. Interstitial Radium Therapy in Carcinoma of the Cervix.

By G. W. WATERMAN. Radiology, 49, 411-412, Oct. 1947. 1 ref.

At the Rhode Island Hospital interstitial radium therapy has been used in the treatment of carcinoma of the cervix since 1926. Long needles of 0.66 mg. per cm. intensity and 2 to 3 mm. platinum wall are used. They are inserted into the advancing zone of growth, and a platinum capsule of 20 mg. is inserted into the cervico-uterine canal, the whole being left in situ for 7 days. Advantages claimed for this method are: (1) Slow continuous irradiation for a long time. (2) Extreme adaptability to all types of cervical cancer. (3) The radiation is delivered in and around the growth and not on the vaginal walls. Complications such as fistula, necrosis, and sepsis have been no more frequent than with other forms of therapy. Sulphonamides, penicillin, and preliminary X-ray irradiation have decreased the incidence and danger in infection. The absolute 5-year survival rate in 198 cases was 38.9 per cent; for 171 cases treated with radium alone the figure was 44.4 per I. G. Williams cent (relative).

1348. Results and Causes of Failure of Radiation Therapy in Carcinoma of the Cervix.

By H. S. Kaplan, H. M. Wilson, and A. H. Morse. Surg. Gynec. Obstet., 86, 332-340, Mar. 1948. 25 refs.

1349. Technique of Radium Therapy in Carcinoma of the Cervix Uteri. (Sur la technique de la Curiethérapie des cancers du col de l'utérus.)

By E. Wallon. Presse méd., 56, 244-245, Mar. 31, 1948.

1350. Radiation Therapy of Carcinoma of the Cervix. By J. P. Connolly. Connecticut med. J., 12, 114-115, Feb. 1948.

1351. X-ray Therapy of Carcinoma of the Cervix. (Die Strahlenbehandlung des Kollumkarzinoms.)

By P. Hess and A. Proppe. Strahlentherapie, 77, 199-210, 1948. 3 figs., 28 refs.

1352. Radiation and Surgical Trends in the Treatment of Cancer of the Cervix Uteri.

By A. N. Arneson. Amer. J. Roentgenol., 59, 251-259, Feb. 1948. 16 refs.

1353. Late Recurrence of Cervical Carcinoma Following Radiation Therapy.

By H. Speert. Amer. J. Obstet. Gynec., 55, 533-537, Mar. 1948. 3 figs., 5 refs.

1354. Results of Treatment in Adenocarcinoma of the Cervix Uteri. (Behandlungsergebnisse beim Adenokarzinom des Collum uteri.)

By B. Schink. *Zbl. Gynäk.*, **69**, 338-349, 1947. 16 refs.

Out of 1945 cases of carcinoma of the cervix treated in the Universitäts Frauenklinik in Jena from 1927 to 1941, 34 were of adenocarcinomata—8 were operable, 5 borderline cases, and 21 inoperable. Only 3 patients were operated upon, the rest being treated with radium followed by deep X-ray therapy. A total of 5,000 to 6,000 mg.-hours was given in two stages, the radium being at first inserted into the cervical canal, but later into

the uterine cavity. From 1940 onwards mesothorium was in use. Seven patients lived for over 5 years. The cure rate in operable cases was 31.7 per cent and in inoperable cases, 14.3 per cent; the primary mortality rate was 3.5 per cent. From these results the following conclusions are drawn. Adenocarcinoma of the cervix can be cured by radio-therapy, the dosage being the same as for squamous carcinoma. Since adenocarcinomata infiltrate the parametria and reach the pelvic wall earlier than do squamous-cell carcinoma, early diagnosis is more important. The recurrent adenocarcinoma does not respond to irradation.

L. Ganz

1355. Syphiloma of the Neck of the Uterus. (Sul sifiloma del collo dell'utero.)

By A. V. FERRARI. Dermosifilografo, 122, 207-

226, Sept.-Oct. 1947. 29 refs.

Syphiloma of the cervix, though mentioned in all textbooks, is still considered to be very rare and is often not detected. It is mostly situated on the anterior lip of the cervix. In diagnosis of this \_\_\_ syphiloma, as in almost all syphilomata, the finding of enlarged lymph nodes is important; because they accompany every syphilitic infection. The author points out the need for clinical and laboratory examinations for syphilis whenever there are erosions or ulcerations of the cervical mucosa. He describes 6 cases personally observed, some of which demonstrate how easily this lesion may escape observation, even by skilled clinicians. It is concluded that: (1) syphiloma of the cervix is not so rare as it has been thought to be; this fact is demonstrable if systematic investigations are carried out in cases of recent secondary syphilis; (2) diagnosis is not easy, since syphiloma of the cervix does not always cause subjective symptoms and may be confounded with other lesions; (3) a search for enlarged pelvic lymph nodes, the usual lymphatic reaction in this particular type of syphilitic lesion, may help diagnosis.

Kate Winkler

1356. Pain in Uterine Malformations. The Role of Endometriosis and its Bearing on Therapy. (Les douleurs dans les malformations utérines: le rôle de l'endométriose et ses conséquences thérapeutiques.)

By J. Mathieu. Gynéc. et Obstét., 47, 159-163, 1948.

1357. Endometriosis at Sites Distant from the Uterus. (Endometriose à distância do útero.)

By C. C. Da Costa. An. brasil. Ginec., 25, 7-16, Jan. 1948. 6 figs.

1358. The Surgical Aspects of Endometriosis.

By V S. COUNSELLER. J. int. Coll. Surg., 11, 29-33, Jan.-Feb. 1948. 4 refs.

1359. Uterine Endometriosis. (L'endometriosi uterina interna.)

By A. PAVONI. Mon. ostet.-ginec., 18, 238-266, July-Dec. 1947. 32 refs.

1360. Recurrence of Bilateral Ovarian Endometriosis after Castration. Favourable Effect of Testosterone. (Récidive d'une endométriose ovarienne bilatérale après castration. Action favorable de la testostérone.)

By E. Delannoy. Gynéc. et Obstét., 46, 533-

536, 1947. 1 ref.

The author describes a case of endometriosis, in a woman of 42, treated by bilateral removal of the Within 3 months exactly the same symptoms developed, pain, a mass in the abdomen, and vaginal bleeding, which the author considers to be due to recurrence of the endometriosis. He quotes numerous writers who suggest that such symptoms may be due to a residual cyst of the ovary, but he thinks it more likely that small fragments of the endometrioma were left behind. He reviews briefly the various suggested treatments and notes his success with small doses of testosterone (520 mg. a month to begin with and a maintenance dose of 100 mg. monthly). With these small dosages he has not observed the masculinizing reactions noted by other authors.

[This article suggests a useful method of treatment of the endometriomata, which often present an apparently insoluble problem when they recur after operation. These experiences with testosterone call for a wider investigation in Britain. It is a pity that the very full list of authors mentioned in the article is accompanied by only one reference.]

B. Sandler

1361. X-Ray Treatment of Ovarian Carcinoma. (Zur Strahlentherapie der Ovarialcarcinome.)

By J. H. MUELLER. Gynaecologia, Basel, 125, 67-73, Jan.-Feb. 1948. 6 refs.

1362. Functional Tumours of the Ovary. (Tumori ovarici a funzionalità sessuale.)

By A. Bompiani. Riv. ital. Ginec., 30, 364-396, 1947. Bibliography.

1363. Is the Brenner Tumour always a Benign Neoplasm? (Ist der Brenner-tumor immer eine gutartige Neubildung?)

By V. Dubrauszky and W. v. Massenbach.

Zbl. Gynäk, 69, 370-381, 1947. 20 figs., 51 refs. A woman 70 years of age complained of repeated slight vaginal haemorrhage of 2 years' duration and also of swelling of her abdomen. At laparotomy 3 litres of ascitic fluid were withdrawn and a left ovarian tumour was removed. The enlarged uterus was curetted. The tumour was partly solid, partly cystic; on the cut surface there was an area of medullary consistency. Histologically it consisted of epithelial nests embedded in a fibrous stroma. Some of the cysts were lined with many layers of an indifferent epithelium, whereas in others the innermost layer consisted of cylindrical epithelium staining with mucicarmine. The medullary part of the tumour, which showed definite signs of malignancy, consisted of heaped-up atypical epithelial cells separated by fine fibrous septa; some areas showed giant-cell formation. The malignant

tissue formed the wall of some cysts, and the transition of the benign epithelium into the malignant could easily be followed. This would appear to be the first case of a definitely malignant Brenner turnour.

The authors believe that the Brenner tumour originates from the coelomic epithelium, and that some of the solid carcinomata and cystic adenocarcinomata of the ovary may originate in a Brenner tumour. The Brenner tumour does not produce any oestrogenic hormone; the bleeding in this case was caused by a polypoid hyperplasia of the endometrium.

L. Ganz

1364. A Pseudomucinous Cyst of the Ovary with Ascites and Hydrothorax.

By S. S. ROSENFELD. New York St. J. Med., 48, 527-528, Mar. 1, 1948. 2 refs.

1365. Dermoid Cysts of the Ovary: Suppuration and External Fistula Formation. (Contributo allo studio delle cisti dermoidi ovariche suppurate e fistolizzate alla parete.)

By G. D'Errico. G. ital. Chir., 4, 99-107, Feb.

1948. 4 figs., 12 refs.

1366. The Meigs Syndrome. (Le syndrome de Meigs.)

By P. Funck-Brentano. Gynéc. et Obstét., 47, 150-158, 1948. 31 refs.

1367. Theca-cell Tumour of the Ovary. (Une observation de tumour thécale d'un ovaire.)

By P. Guenin and R. Messimy. Mém. Acad. Chir., Paris, 74, 186-190, Feb. 25 - Mar. 3, 1948. 5 figs.

1368. Tumours of the Theca Interna of the Ovary: Three Cases, One Associated with Adenocarcinoma of the Uterine Body. (Les tumeurs de la thèque interne de l'ovaire rapport de trois cas, dont un accompagne d'un adéno-carcinome du corps de l'uterus.)

By C. Berdjis Chamsi. Gynéc. et Obstét., 46,

655-665, 1947. 4 figs., 36 refs.

1369. Krukenberg Tumours. (Considérations sur les tumeurs ovariennes "Type Krukenberg".)

By P. SARBU, V. VASILIU, and E. MESTES. Gynéc et Obstét., 47, 178-184, 1948. 3 figs., 38 refs.

1370. A Clinical Review of Papillary Adenocarcinoma of the Ovary.

By G. Speck. Virginia med. Mon., 75, 185-190, Apr. 1948. 18 refs.

1371. Struma Ovarii.

By G. E. Norwood. Ann. west. Med. Surg., 2, 19-21, Jan. 1948. 14 refs.

Operations.

1372. Gynecologic Surgery in the Elderly Woman. By A. F. Lash. Geriatrics, 3, 67-71, Mar.-Apr., 1948. 6 refs. 1373. Some Urological Problems in Gynaecological

Surgery.

By E. WILLIAMS, C. LEWIS, R. O. WARD, C. G. TURNER, C. S. RUSSELL, J. C. MOIR, and V. B. GREEN-ARMYTAGE. *Proc. R. Soc. Med.*, 41, 143-150, Mar. 1948. 1 ref.

1374. The Use of Gelatin Sponges in Gynecologic Surgery.

By J. W. HUFFMAN. Quart. Bull. Nthwest. Univ. med. Sch., 22, 53-55, Spring Quarter 1948. 5 refs.

1375. Uterine Bleeding with View Toward Conservative Pelvic Surgery.

By A. Vesper. Kentucky med. J., 46, 38-44,

Feb. 1948.

1376. Use of Vesical Peritoneum to Cover Raw Areas after Pelvic Operations. Its Obstetric Consequences. (La péritonisation du petit bassin avec le péritoine vésical. Ses conséquences obstétricales.)

By G. Cotte and J. Mathieu. Rev. franç.

Gynéc., 43, 12-20, Jan. 1948.

1377. Dicumarol Prophylaxis Against Venous Thrombosis in Women Undergoing Surgery.

By G. VAN S. SMITH. Surg. Gynec. Obstel., 86, 461-464, Apr. 1948.

1378. Prophylaxis of Post-operative Thrombosis in Gynaecology. (Profilaxis de la trombosis post-operatoria en ginecología.)

By M. Pensado. Toko-ginec. pract., 7, 41-58,

Feb. 1948. 34 refs.

1379. Congenital Absence of Vagina. Repair by the Kirschner-Wagner Method with Free Skin Graft. (Ausenica congénita de vagina. Método de Kirschner-Wagner. Injerto libre de piel.)

By A. J. PAVLOVSKY and A. OGHI. Prensa méd. argent., 35, 396-401, Mar. 5, 1948. 7 figs., 2 refs.

1380. Creation of an Artificial Vagina by Schubert's Method. (Création d'un neo-vagin par la méthode de Schubert.)

By G. Cotte and P. Santy. Mém. Acad. Chir., Paris, 74, 54-57, Jan. 1948. 1 ref.

1381. Treatment of Vaginal Aplasia. (Sobre el tratamiento de la aplasia vaginal.)

By C. P. ALVAREZ. Rev. esp. Obstet. Ginec., 7, 33-44, Jan.-Feb. 1948. 2 figs., Bibliography.

1382. Aplasia Vaginae. Two Cases Treated by Frank's Method. (Aplasia vaginae.)

By S. Sjostedt. Nord. Med., 37, 405-407, Feb. 27, 1948. 2 figs., 46 refs.

1383. Culdoscopy. (L'endoscopia pelvica per via vaginale (culdoscopia).)

By M. Tortora. Arch. Ostet. Ginec., 53, 25-30, Jan.-Feb. 1948. 2 figs., 13 refs.

1384. Skiodan Acacia in Hysterosalpingography. By M. Mass. J. med. Ass. Georgia, 37, 84-85, Mar. 1948. 1385. Accidental Intravascular Injection of "Lipiodol" during Hysterosalpingography. (Injections vasculaires accidentelles de lipiodol survenant au cours de l'hystérosalpingographie.)

By R. Keller. Gynéc. et Obstét., 47, 27-41,

1948. 2 figs., 23 refs.

1386. Tubal Insufflation and Hysterosalpingography. (Persufflazione transtubarica e isterosalpingografia.)

By R. Pogolotti. Arch. Sci. med., 73, 157-

198, Apr. 1948.

1387. Obstetric Sequelae of Ligamentopexy by the Doléris-Pellanda Technique. (Conséquences obstétricales des ligamentopexies suivant la technique de Doléris-Pellanda.)

By J. Gonnet. Rev. franç. Gynéc., 43, 27-34,

Jan. 1948.

1388. Sarcoma Botryoides Vaginae, Complete Excision of the Tumour in an Infant by the Combined Abdominal and Perineal Approach.

By H. Ulfelder and S. H. Quan. Surg. Clin. N. Amer., 27, 1240-1245, Oct. 1947. 5 figs., 4 refs.

A sarcoma botryoides vaginae in a girl of 26 months was treated by radical excision of the uterus and vagina through a combined abdominal and perineal approach. Such radical surgery is justified by the low rate of distant metastases in reported cases and by the high recurrence rate when local excision is performed alone or combined

with radiotherapy.

Preoperatively radiological examination was carried out to exclude metastases; penicillin was given intramuscularly for 24 hours, and a transfusion of 250 ml. of blood was started preoperatively and carried on throughout the operation. The diagnosis was confirmed by finding malignant cells in a vaginal smear. A right paramedian incision was used, the Fallopian tubes and ovaries were conserved and the uterus and upper two-thirds of the vagina removed in toto, with ligation of the uterine vessels at their origins and careful separation of the bladder and ureter in front and at the sides, and of the rectum at the back. The pelvic peritoneum was reconstructed and the abdominal wound closed. With the patient in the lithotomy position a deep perineal incision was made for exposure, and the remainder of the vaginal wall removed; this wound was packed and a catheter tied into the bladder. Postoperatively streptomycin and sulphadiazine were used to prevent infection; the catheter came out spontaneously on the sixth day and normal micturition began on the thirteenth day, but catheterization for residual urine was still necessary several months

The tumour was pedunculated and not invasive. There was a covering of squamous epithelium over a mass of spindle cells with large pale nuclei and acidophilic cytoplasm, which ended in long thread-like processes blending with other cells. Other

spindle cells showed faint striation suggesting imperfect muscle fibres. There were also myxomatous areas.

[More details of preoperative and postoperative care would have been useful. It is not clear why streptomycin was used at all.] Hugh R. Arthur

1389. Vesico-vaginal Fistula.

By B. W. TURNER. J. Urol., 58, 359-366, Nov.

1947. 3 figs., 33 refs.

This paper is devoted mainly to the advocacy of the vaginal approach in the treatment of practically all forms of vesico-vaginal fistula and some uretero-vaginal fistulae. After comparison with transvesical methods, the author gives a description of the technique which he has found most satisfactory in 27 cases of vesico-vaginal fistula treated at the Texas Urological Institute, Houston, Texas. This embodies a preliminary examination to detect any extraneous defects or complications and to establish the presence or absence of multiple fistulae. Fistulous tracts and adjacent tissue must be in a healthy state, free from cancer extension, granulation, radiation reaction, and slough, and the function of both kidneys must be adequate before operation. Preoperative preparation includes sulphonamide and penicillin therapy together with the administration of vitamin C and oestrogens.

At operation the exaggerated lithotomy position is employed, and the bladder drained by continuous aspiration through a urethral catheter. Dissection is begun circumferentially around the fistula, and episiotomy performed if necessary to improve access. As the dissection proceeds the various planes of vaginal mucosa, vaginal fascia, vesical muscle, vesical fascia, and vesical mucosa are clearly identified and freed. After horizontal suture of the vesical mucosa has rendered the bladder watertight, the most important part of the operation is carried out. This consists in raising a buttress or bridge support composed of the muscle and fascial tissue, again in the horizontal plane, by means of two rows of sutures inserted in such a manner as to avoid apposition. Finally, the vaginal fascia and mucosa are closed with interrupted nylon sutures placed well out from the edges of the incision.

A petrolatum gauze dressing is left in the vagina for 24 hours, and thereafter the vagina is cleansed daily with cotton swabs. An indwelling No. 20 Malecot catheter is retained for 15 to 18 days, being changed every fifth day to reduce the tendency to incrustation. The nylon sutures are left in place for 21 days. No case histories are given, but in every instance in which the prerequisites of a successful result were present, the fistula was closed in one operation.

[The abstracter considers the author's condemnation of transvesical methods to be somewhat dogmatic. No indication of the size of the fistulae is given, and the methods advocated by MacAlpine (Brit. med J., 1940, 2, 778) and Twombley and

Marshall (Surg. Gynec. Obstet, 1946, 83, 348) for dealing with large defects are not mentioned.]

I. D. Fergusson

1390. A New Technique for Treatment of Vesicovaginal Fistulae by the Vaginal Route. (Nueva técnica para el tratamiento de las fistulas vésicovaginales por via vaginal.)

By E. Belt. Rev. esp. Obstet. Ginec., 7, 45-51, Jan.-Feb., 1948. 8 figs.

1391. Treatment of Vesico-vaginal Fistulae. (Tratamiento de las fístulas vésicovaginales.)

By S. D. FONT. Toko-ginec. pract., 7, 73-79, Feb. 1948.

1392. Transplantation of the Levator Muscles in the Repair of Complete Tear and Rectovaginal Fistula. [In English.]

By A. INGLEMAN-SUNDBERG. Acta chir. scand., 96, 313-316, Feb. 28, 1948. 4 figs., 9 refs.

1393. Two Cases of Inversion of the Uterus Treated by Anterior Abdominal Hysterotomy. (Author's technique.) (Dos casos de inversion del útero, tratados por colpo-cérviço-histerotomia anterior abdominal. (Técnica de autor.))

By J. Octjo. Rev. méd. cubana, 58, 427-442,

June 1947. 8 figs.

The author reviews fifteen different types of manipulative and operative treatment of inversion of the uterus carried out by the vaginal and abdominal routes, and then describes in detail his own technique. He distinguishes between acute, subacute, and chronic inversion. In acute inversion immediate replacement should be performed before shock develops or there is much haemorrhage; it is nearly always successful. If there is shock without haemorrhage, anti-shock treatment is carried out and manipulation postponed. If haemorrhage continues, packing is tried; if this fails, vaginal taxis is attempted; and if this is unsuccessful rapid abdominal operation is performed. In subacute inversions the initial risk is over, but infection and slight haemorrhage may occur. The patient's general condition must be improved by such measures as blood transfusion, and infection treated with penicillin and the sulphonamides and by local vaginal methods, including packing with iodoform gauze, which may even In chronic result in spontaneous reduction. inversion there is no sign of infection or tendency to haemorrhage, and operation is always necessary.

In both of the author's cases operation was carried out 2 months after delivery. After opening the abdomen and packing off the intestines, he applies Allis forceps to the constricting ring behind the round ligaments. The fold of utero-vesical peritoneum is then incised, and the bladder pushed down extensively off the vagina, as in the Wertheim operation. With one blade of the scissors in the depression a midline incision anteriorly is made through the constricting ring into the vagina.

The fundus is then replaced in the abdomen with the fingers and re-inverted. This is possible without force, and the incision can be enlarged upwards or downwards if necessary, though it should not be unduly long. After the surgeon has changed his gloves, the incisions in the uterus and vagina are closed in two layers, and a small gauze drain is left in the lower part of the wound proiecting into the vagina. The incision is completely over by the utero-vesical fold of peritoneum, and a ligamentopexy of the Doleris-Gilliam or Crossen-Gilliam type carried out. This operation is rapid, bloodless, clean, and easy. It can be carried out whenever the state of the uterus permits of its conservation, but if gangrene or severe infection is present a hysterectomy is essential. There is little bleeding, because the incision is in the midline of the uterus. The ligamentopexy and covering of the incision with peritoneum prevent the spread of infection into the abdomen and also any recurrence or retroversion. Owing to the level of the incision in the uterus the risk of rupture of the scar in a subsequent pregnancy is not great. Both of the author's patients made good progress. One of them has since had 5 pregnancies, one of which ended in premature labour after an accident, but all the others were uneventful and labour was normal.

Bryan Williams

1394. Labhardt's Operation in the Treatment of Genital Prolapse in Elderly Women. (L'opération de Labhardt dans le traitement des prolapsus génitaux chez les femmes âgées.)

By J. Mathieu. Rev. franç. Gynéc., 43, 21-26,

Jan. 1948.

1395. Vaginal and Uterine Prolapse. (Il prolasso delle pareti vaginali e dell'utero.)

By T. Nobile. Ginecologia, Torino, 14, 49-64, Feb. 1948. 11 refs.

1396. Controversial Details of Complete Hysterectomy.

By H. O. Jones. *Texas J. Med.*, 43, 688-690, Mar. 1948.

1397. Hysterectomy of Election in Benign Conditions. (Indicação eletiva da histerectomia nos processes benignos.)

By A. P. De Queiroz. An. brasil. Ginec., 25, 17-32, Jan. 1948. 21 refs.

1398. Hysterectomy for Fibroids Followed by Perivesical Abscess (? Ureteric Injury). Histerectomía por fibromioma seguido de flemón perivesical (? Por lesión de uréter).)

By S. DEXEUS FONT and I. ORSOLA MARTI. Med. esp., 19, 23-25, Jan. 1948. I fig.

1399. Reflex Anuria after Hysterectomy for Fibroids. (Anuria secretora, refleja, consecutiva a histerectomía por fibromioma uterino.)

By I. Orsola Marti and S. Dexeus Font. *Med.* esp., 19, 110-116, Jan. 1948. 2 figs., 8 refs.

1400. New Data on the Treatment of Sequelae of Castration. (Neues zur Therapie der Kastrationsfolgen.)

By A. Saurer. Schweiz. med. Wschr., 78, 197-

199, Mar. 6, 1948. 2 figs., 6 refs.

1401. The Evaluation of the Results of Carcinoma of the Cervix Uteri Treated by Radical Vaginal Operation.

By S. MITRA. Amer. J. Obstet. Gynec., 55, 293-298, Feb. 1948.

1402. Plastic Operations for Sexual Ambiguity. (Gynandrynes and Androgynes.)

By G. COTTE. J. Mt Sinai Hosp., 14, 170-174,

Sept.-Oct. 1947. 3 figs.

This is a technical account of operations performed on three patients with malformations of the genital tract, commonly classed as constituting hermaphroditism. Two of the patients had functioning ovaries and a normal though small uterus. The vagina was absent in both cases, at least on external examination. In fact, a small vagina communicating with the perineal portion of the urethra was present. Both patients had the instincts and external characteristics of a female, but owing to the masculine though poorly developed appearance of the genitals one had been. brought up as a boy until the age of 16 years, when the menarche occurred. Plastic operations succeeded in exposing the vagina and establishing a vulval cleft. One patient subsequently had two normal pregnancies, but both infants were delivered by Caesarean section.

The third patient had been brought up as a female but was in fact a cryptorchid male with hypospadias, whose atrophied testes had been removed 4 years earlier during operation for bilateral inguinal hernia. Plastic operation on the perineum to give it a more feminine aspect and to provide a pseudo-vagina was performed with the full knowledge of her marriage partner.

M. Baber

1403. Plastic Operations for Ambiguity of Sex. (Opérations plastiques pour ambiguité sexuelle (gynandres et androgynes.)

By G. COTTE. Rev. franç. Gynéc., 43, 1-11, Jan. 1948. 7 figs.

340. / 1165.

1404. Problem of Ureter Implantation per vaginam. [In English.]

By L. LAJOS. Gynaecologia, Basel, 125, 1-8, Jan.-Feb. 1948. 13 refs.

1405. Perineal and Vaginal Total Cystectomy.
By B. S. VALLETT. Delaware med. J., 20, 6-7, Jan. 1948. 2 refs.

1406. The Treatment of Urinary Stress Incontinence by the Implantation of a Tantalum Plate.

By M. A. Goldberger and A. M. Davids. *Amer. J. Obstet. Gynec.*, 54, 829-837, Nov. 1947. 6 figs., 16 refs.

The authors, having tried various methods of repair for the relief of stress incontinence with not entirely satisfactory results, have now resorted to the use of a tantalum plate fixed in position beneath the proximal third of the urethra and the urethro-vesical junction. In 18 cases the immediate result was completely satisfactory. The tantalum plate, which is 0.004 in. (0.01 cm.) in thickness and " of proper length", is stitched to the periostenm on the inner aspect of the descending rami of the os pubis by means of a tantalum suture o.015 in. (0.0375 cm.) in diameter. Because the distance between the pubic rami varies in different patients it is necessary to use plates of different length. The size most often used was 11/2 in. (2.85 cm.) in length and 5/16th in. (0.75 cm.) in width. No foreign-body reaction has been observed in the tissues as a result of the implantation of the metal. The purpose of the plate is "to provide a permanent fixed posterior urethral plane". It reinforces the weakened urogenital diaphragin, thus preventing the extension of the bladder cavity into the proximal portion of the urethra. Cystograms are reproduced to illustrate this point. G. Gordon Lennox

1407. The Fascial Sling Operation for Incontinence of Urine.

By J. V. Meigs. J. Mt Sinai Hosp., 14, 504-514,

Sept.-Oct. 1947. 3 figs., 11 refs.

The author describes his sling operation for the cure of stress incontinence. The main difference from the Aldridge operation is that the urethra is pulled up higher and there is no break in the continuity of the fascia. The author has performed

the operation 19 times; in 10 the result was excellent, in 3 good, in 2 fair (incontinence persists at night). In 4 the operation was not successful; 2 of the patients are neurotic and it was difficult to assess their answers to questions. In another of these 4 failures an abscess formed after operation and drained through the vagina. The other failure was in a diabetic patient, in whom cystoscopic examination showed that the fascial sling was holding up the trigone but that there was bulging of the nrethra below. Gladys Dodds

1408. The Difficult Case of Stress Incontinence.

By T. L. CHAPMAN. Glasgow med. J., 29, 49-52, Feb. 1948. 6 figs., 1 ref.

1409. Persistent Cloaca in the Female: Report of Two Cases Corrected by Operation.

By O. S. Lowsley. J. Urol., 59, 692-707, Apr. 1948. 12 figs., 8 refs.

Miscellaneous.

1.110. Massive Intraperitoneal Haemorrhage due to Torsion and Rupture of an Embryoma in a Girl of 8. (Inondation péritonéale par torsion et rupture d'un embryome chez une fillette de 8 ans.)

By A. Descamps, Brux.-méd., 28, 823-826,

Apr. 18, 1948.

1411. Another Case of Amputation of the Fallopian Tube Caused by Torsion of a Cyst. (Novší prípad amputácie tuby, zapíčineny torzious cysty.)

By E. DLHOS. Bratislavské lekárs. List., 28,

127-129, Feb. 1948. 1 fig., 1 ref.

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## ON THE CHOICE OF TREATMENT OF INDIVIDUAL CARCINOMAS OF THE CERVIX BASED ON THE ANALYSIS OF SERIAL BIOPSIES

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It is an unfortunate but undeniable fact that out of every 100 women with carcinoma of the cervix who present themselves for treatment about 75 die of cancer within 5 years. Further, it is quite certain that by no means all the patients who die present themselves at a time when the growth is too advanced to give any hope of a cure, for anyone who has had much experience of this disease must have seen patients with tumours limited to the cervix, who about 18 months to 2 years after radium therapy have presented themselves at the follow-up clinic with a local recurrence. Such an event naturally causes the surgical enthu-

siast to be certain in his own mind that radical surgery would have prevented this happening, and may even lead an ardent radiotherapist to entertain doubts concerning the efficacy of radium in such a case. It is not unnatural, therefore, that in recent years there should have been a renewed interest in the use of radical surgery in the treatment of carcinoma of the cervix. The difficulty of selecting patients for radical surgery is well known and selection is mostly based on the personal impressions of the surgeon who is to perform the operation. He usually tends to select younger, fit women with tumours confined to the cervix. In such cases the results of an adequate radical operation are good, but it is by no means certain that such results could not have been achieved with radium at less risk

<sup>\*</sup> Working with a grant from the British Empire Cancer Campaign.

<sup>†</sup>Working with a grant from the Northern Council of the British Empire Cancer Campaign.

to the patient. On the other hand the radiotherapist, confident that he could cure every case of this type, must be quite surprised to find ultimately, in a certain percentage of even such early tumours, a recrudescence on the cervix.

The introduction by one of us (A.G.) of the cell-count technique of determining whether or not the response of a tumour to radiotherapy was favourable appeared to offer a rational basis of selection of patients who would be unsuitable for treatment with radiotherapy alone and to attempt to salvage by surgery as many patients with radio-incurable tumours as possible. In a series of several hundreds of cervical carcinomas the prognosis regarding the local results of treatment was based on the histological assessment of serial biopsies cervix. obtained before and during irradiation, and since the clinical findings after 2 to 5 years confirmed this prognosis in about 90 per cent of cases (Glucksmann, A., and Spear, F. G., 1945, and unpublished data) the cellcount technique appears to be a reliable procedure. We have used this method continuously since December 1946, and this preliminary communication describes our clinical and pathological experiences in a group of 88 cases with an unfavourable cytological response to radium and indicates the possibility of employing surgery in dealing with this type of case. In this series we have tried to reduce the personal element by confining the work to as few persons as possible. The clinical work has been carried out by one of us (S.W.) who acknowledges the assistance of Dr. R. Dearing and Dr. W. Ross, while the histological work has been in the hands of one of us (A.G.) and thus we have, as far as possible, achieved uniformity throughout the series.

During the period under review (December 1946 to June 1948) 149 cases were studied, whilst at the same time 53 other

cases were treated but were not studied. Fifty-two of these were in stages 3 and 4, and one in stage 2. This latter patient was suffering from congestive heart failure which proved fatal I month after admission.

All cases were submitted to cystoscopy before treatment, but shortage of diagnostic X-ray facilities made it impossible to submit every patient to routine radiographic examination of the chest, spine, and urinary tract, although all cases submitted to operation subsequent to radium were examined in this way.

#### STAGING.

Our staging criteria are as follows:

Stage I. The tumour is limited to the cervix.

Stage 2. The tumour invades the vaginal vault and/or extends into one or both broad ligaments, but this extension is not fixed to the pelvic wall.

Stage 3. The tumour invades the lower third of the vagina and/or extends into one or both broad ligaments and the extension is fixed to the pelvic wall.

Stage 4. The tumour invades the bladder or the rectum, or there are remote metastases.

It is impossible to determine clinically whether or not the lymph nodes are involved, and the staging therefore refers to the primary tumour and its immediate extensions only.

It is not our practice when dealing with endocervical tumours to place them in a stage lower than the clinical findings suggest, as is customary in some clinics.

In assessing cystoscopic appearances, obvious ulceration or hypertrophic tumour and massive bullous oedema are interpreted as indications of bladder involvement but the presence of generalized oedema of the bladder base is not regarded as such.

Method of obtaining biopsies. Young

areas of tumour are essential for cytological study, and therefore the area selected for section must be taken from the growing edge of the tumour. Masses of necrotic material broken off with the finger are not suitable. The cervix is drawn down with a volsellum and a small wedge cut from the tumour edge with a knife. Biopsies must not be taken with diathermy as the heat generated destroys the cellular structure. The specimen is immediately placed into a tube containing Sausa fixative, in which it is left for 3 hours before being transferred to 80 per cent alcohol. The subsequent biopsies taken during irradiation are slightly more difficult to obtain owing to shrinkage of the tumour and contraction of the vault, but usually no serious difficulty is encountered. This procedure can quite easily be carried out by any gynaecologist who is accustomed to operate on the cervix, and out of a total of 149 cases, only in 7 instances has a prognosis not been possible because of a totally inadequate biopsy. It is, however, not a procedure which should be left to a junior house surgeon.

Radium technique. The method of irradiation used at first was a modification of the Stockholm technique in which a dose of not less than 7,500r was delivered to "point A" in two equal doses separated by an interval of 7 days. The dose received on the surface of the tumour is not less than 10,000r and often more than This technique was adopted during the war when bed accommodation was severely limited, but since November 1947 we have reverted to a 3-dose technique with a week's interval between the first and second, and a 2 weeks' interval between the second and third applications. The total dose remained the same but was given in an over-all time of 23 instead of 10 days.

Surgery. The extent of the radical operation is based on the technique described by Comyns Berkeley and Victor Bonney (1935) and consists of the removal of the uterus, Fallopian tubes, and ovaries and the upper nine-tenths of the vagina, the broad ligaments, the pelvic connective tissue and the lymph nodes lying along the course of the external and internal iliac vessels and the obturator node. If these nodes are obviously involved the dissection is carried up to the aortic bifurcation and higher if necessary. Continuous blood transfusion is given throughout the operation and spinal anaesthesia is supplemented by sufficient inhalation or intravenous anaesthesia to keep the patient asleep.

Our present procedure is as follows:

The patient is examined under anaesthesia and the tumour staged, the preliminary biopsy taken and the first application of radium given. A week later a second biopsy is taken and the second application of radium given. During the following 2 weeks' interval the histological analysis is made and the prognosis obtained. In the few cases where a further biopsy has appeared advisable this was taken during this interval.

If the prognosis is favourable the third application of radium is given, followed 2 weeks later by bilateral iliac adenectomy and in a series of 10 cases thus treated so far only 1 showed node involvement.

If the prognosis is unfavourable and the case is suitable for radical surgery then no further radium is given and a radical hysterectomy is performed 6 weeks later. If, however, the prognosis is unfavourable and the tumour is inoperable a further application of radium is given but iliac adenectomy is not performed.

At first a full dose of radium was given before operation, but it was found that the combined treatment was sometimes followed by massive pelvic necrosis. After this experience in the next 7 cases, the first dose only was given and operation performed 2 weeks later. This proved even more un-

satisfactory as it entailed removing a necrotic infected cervix and was followed by very severe pelvic sepsis leading to the death of 3 patients. As a result of this experience the technique described above was adopted, since when there has been only I case of necrosis and no postoperative deaths.

Quantitative histological analysis of serial biopsies. The following principles are adopted for the interpretation of histological appearances: young areas are selected for analysis in each biopsy and the cell population of these selected foci is counted in 4 categories: resting (potential dividing "stock" cells), mitotic, differentiating (mainly keratinizing and parakeratotic cells), and degenerating cells. The detailed histological methods employed and the general characters of the 4 cell types have been described previously (Glucksmann, A., 1947).

In cases in which the tumour fails to respond to irradiation treatment the histological picture before and after exposure to radium is approximately the same. There is usually actively growing tumour tissue present after a dose of about 4,000r to 5,000r and these histological appearances would be reported as active growth by any pathologist. Though the growth of such tumours may be slowed down temporarily by inhibition of division of tumour cells, by vascular damage or by the often developing fibrosis, this retardation of growth very rarely suffices to bring about a "cure", but may delay the recurrence of symptoms.

In order to recognize the histological features of a favourably responding tumour a good deal of experience and a detailed acquaintance with normal and pathological cytology is necessary. While general principles can be laid down for the assessment of viability of cells, their application to the individual tumour necessitates the introduction of various modifications.

A favourable response of the tumour tissue to irradiation is indicated by the complete elimination of viable cells (resting and mitotic) and their replacement by nonviable (differentiating and degenerating) cells. In such cases there is an increase not only in the percentage of differentiating cells but also in the degree of differentiation (i.e. a nearer approach to the normal stages in keratinization), and usually a marked increase in the incidence of abnormal mitotic and of degenerating cells. It has been found, however, that in epitheliomatous growths a mere marked increase in necrosis, without an increase in differentiation, rarely suffices to effect a "cure". In favourable cases no normal mitotic cells should be found 7 days after the first radium insertion and the percentage of resting cells should have fallen to below 30; while the percentage, particularly of differentiating, but also of degenerating cells, should have risen correspondingly.

Minor variations in the percentage of viable cells such as their reduction by 20–30 per cent 7 days after a dose of about 4,500 to 5,000r at the biopsy site are considered as partial responses and interpreted as an ultimately unfavourable prognostic sign.

Since in the treatment of cervical cancer the dose distribution in the pelvis is uneven, a favourable prognosis given for the fully treated primary tumour may not apply for an involved lymph node which on account of its distance from the radium source has been insufficiently treated. A favourable prognosis holds, therefore, only for the fully treated region. An unfavourable prognosis for the tumour at the biopsy site applies, of course, also to the less fully treated regional nodes.

The clinical results of treatment can be assessed with some certainty only after a considerable interval and for this reason the "five years symptom-free survival rate" is generally adopted. This delayed assess-

ment of clinical results implies that recurrence of symptoms due to persistence of tumour tissue may be postponed for periods of years and it is generally true that this delay is the shorter the more advanced the tumour was at the beginning of the treatment. It is thus not surprising to find no clinical signs of disease during the first years after treatment in stage I and 2 cases even though there is histological evidence of persisting tumour activity. In those cases of the present series where, following an unfavourable histological prognosis Wertheim's operation was performed 8 weeks after a full course of radium therapy (Table IV, cases 1-15) active tumour tissue was found in the cervix of all operation specimens. In the other surgically treated cases which received only one-third or twothirds of the full radium dosage, active tumour tissue was found in the cervix in all but one case. In this exceptional case only part of the cervix was available for histological examination, but a number of associated lymph nodes were involved.

The best example of persisting tumour activity giving no clinical symptoms was found in the first case in the series, where two months after completion of a full course of radium therapy the cervix appeared clinically healed. When it was cut open after hysterectomy a mass of active tumour I cm. in diameter was found underneath the intact mucosa. The estimated dose of radium received by this particular area was 18,000r. This patient is still alive and well 20 months after operation, but it is doubtful if she would have been if we had waited for clinical evidence of recurrence (See Plate).

It has been found previously (Glucksmann, A., and Spear, F. G., 1945) that the differentiated types of cervical tumours tend to respond favourably in a greater proportion of cases than do the anaplastic types. In the present series the tumours

were therefore also classified on the basis of the pre-treatment biopsy as to their degree of anaplasia judged by the histogenesis of the tumour tissue, by its morphological and cytological differentiation and by the amount and type of stroma induced. On the basis of this classification the tumour was assigned to the anaplastic (A) or differentiating (D) group.

The 5-year symptom-free survival rate of differentiated cervical tumours is greater than that of anaplastic tumours of equal clinical extent. It is, however, the capacity to respond to irradiation with an increase in extent and degree of differentiation, rather than the amount of differentiation already present in the untreated tumour, which often distinguishes the radio-curable from the radio-incurable tumours. This capacity for increased differentiation as a result of irradiation may be latent in an untreated anaplastic tumour; on the other hand it may have reached its full limit in the untreated differentiated tumour. This capacity, therefore, can be judged only by the behaviour of the tumour tissue before and after an exposure to a "test dose" of radiation.

In the present series of cases, 32 tumours gave a favourable response and of these.

25 were of the differentiating type (per cent  $78 \pm 7.3$ ) while

7 were of the anaplastic type (per cent  $22 \pm 7.3$ ).

Of the 88 cases giving an unfavourable response, 4 were adenocarcinomas, and of the remaining 84 epitheliomas

20 were of the differentiating type (per cent  $24 \pm 4.7$ ) while

64 were of the anaplastic type (per cent  $76 \pm 4.7$ ).

The difference in the incidence of differentiating and anaplastic tumour types between cases giving a favourable and those giving an unfavourable response is per cent 54 ± 8.7. Conversely, of 45 differentiated

tumours 25 (per cent  $56 \pm 7.4$ ) gave a favourable response, while only 7 of 70 anaplastic tumours (per cent  $10 \pm 3.6$ ) responded favourably. The difference in favourable response to treatment between differentiating and anaplastic tumour types of this small series amounts to per cent  $46 \pm 8.2$ .

Operability-rate. Of 149 cases studied 32 showed a favourable histological response to treatment, in 22 the response was probably favourable, and in 7 it was not possible to obtain a prognosis on account of inadequate biopsy material. In 88 the prognosis was definitely unfavourable and it is with these patients that we are concerned in the remainder of this paper.

TABLE I.

Stage Distribution and Operability of Radio-incurable Cases.

	Radio-incurable Case	s.	
STAGE I			
	Operable	9	
	Technically operable	3	
_	Inoperable	0	12
STAGE 2			
	Operable	32	
	Technically operable		
C-1	Inoperable	3	50
Stage 3	Omerahla		
	Operable	. 0	
	Technically operable	0	17
STAGE 4	inoperable	-3	-1
4	Inoperable	6	6
STUMP			
	Operable	ı	
	Inoperable	2	3
	Total		88
Т-	4-1	. c	
	otal operable	46 18	
	,, technically operable ,, inoperable		
	,, inoperable	24	

Table I shows the distribution in stages of the 88 patients whose response to radium was assessed as unfavourable, and shows also the operability as judged by examination under anaesthesia and cystoscopy. By "technically operable" we mean that operation was contra-indicated on account

of concomitant disease or advanced age, but as far as the local condition was concerned it appeared possible to remove the tumour. Our estimated operability rate was then 52 per cent.

It must be remembered that during the same period 53 cases were not studied by serial biopsies, as they were considered inoperable; but against this, account must be taken of 54 other cases in which the response to radium was favourable or probably favourable, because these latter cases were operable and therefore our maximum estimated operability remains at 52 per cent. All except I of the 53 inoperable cases which were not submitted to a cytological study were in stages 3 and 4 and we have no case in this category so far which has shown a favourable response to radium, and therefore we may assume that all these cases would have responded unfavourably. Since it was this very type of case upon which we wished to operate it is therefore probable that our true operability rate would have been 46 cases out of 141 (88 + 53) or 33 per cent; and when we further take into consideration the fact that 10 of our supposed operable cases were found to be inoperable at laparotomy our operability-rate in these unfavourable cases was reduced still further to 26 per cent.

As Table II shows, of the 88 cases which responded unfavourably to radium we succeeded in completing the radical operation in only 28 cases, or 32 per cent. Three other cases were not operated on because they had been given a full therapeutic dose of radium, and by the time they came to operation we had found a high incidence of necrosis when operating on cases which Three others had been fully irridiated. were made inoperable by inflammation and necrosis following radium therapy. In 2 others the tumour did not regress in spite of full radium treatment but had become so extensive that any possibility of opera-

TABLE II.
Surgical Treatment of "Operable" Cases.

Wertheim's hysterectomy completed	ł	28
Wertheim's hysterectomy abandoned	on	
account of:		
Fixed nodes	5	
Fixation of cervix to bladder	3	
Fixation of cervix and fixed		
nodes	I	
Inflammation and necrosis	I	
		10
Wertheim's hysterectomy not consider	red	
on account of:		
Radium necrosis	2*	
Change in radium technique	3*	
Death from intercurrent disease		
before operation	1	
Too rapid extension of tumour		
between radium and opera-	_	
tion	2*	_
		8
Total		46

<sup>\*</sup> Cases included in results in Table III.

tion had disappeared 8 weeks after radium treatment. These 2 patients had very anaplastic tumours which are often thought to be particularly radiosensitive.

The incidence of node involvement. The effect of the presence of growth in the regional lymph nodes on the prognosis is well known. Bonney (1941) has shown that whereas he was able to obtain a 53 per cent 5-year cure rate in cases where the regional nodes were not involved, this figure was reduced to 22 per cent in cases where the nodes were involved. It is obvious, therefore, that the chances of survival are greatly reduced when the tumour has metastasised to the regional nodes.

In this series of Wertheim operations there were 16 cases in which the nodes were involved and 12 in which they were not involved. In addition, in 9 out of 10 inoperable cases on which laparotomy was performed the nodes were microscopically involved, and in the tenth they were not removed, and it is not known whether they contained tumour. Therefore, in 37 cases

in which we have microscopic sections the nodes were involved in 25, or 68 per cent. This is a much higher incidence of node involvement than the 40 per cent quoted by Bonney for his entire series (difference per cent,  $28 \pm 8.0$ ).

It would appear that the type of tumour which responds badly to treatment by radiation frequently metastasises to the regional nodes and this coupled with the comparatively low operability-rate must reflect inevitably on the ultimate result. Since these patients are doomed in any case such survivors as there may be will owe their lives to surgery.

The fate of the cases not treated surgically. Table III shows the fate of the unfavourable cases upon whom operation was not performed. Briefly, if those who are dead with cancer, or living with a recurrence, are classified as unsatisfactory, and those who are living without clinical

Table III.

Fate of Cases not Treated Surgically.

Alive	Dead	Alive with rec.	Died inter- current	Total
Treate	d more th	an six r	nonths.	
3	О	0	0	3
14	4	2	1*	21
2		4	0	9
О	2	2	О	4
I	0	1	0	2
20	9	9	I	39
Treat	ed less th	an six n	nonths	
I	О	0	1	2
1	O	I	0	2
2	0	2	0	4 -
0	0	2	0	2
4	0	5	1	10
	Treated 3 14 2 0 1 20 Treat 1 1 2 0	Treated more the 3	Alive Dead rec.  Treated more than six rec.  3	Alive         Dead         with rec. vurrent         inter-current           Treated more than six months.         3         0         0         0           14         4         2         1*         2         2         1*           2         3         4         0         0         0         1         0         0         1         0         0         1         0         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         2         0

<sup>\*</sup> Active growth on cervix at autopsy.

evidence of recurrence are called satisfactory, then to date (that is 3-20 months) after treatment, 24 (49 per cent) can be described as satisfactory, and if the 10 cases

TABLE IV. Fate of Surgically Treated Cases.

		C1: : 1	ar.	D- 11		Tum	our in	,
No.	Age	stage	Tumour type (1)	Radium dose (2)	Interval (3)	cervix (4		Result
1	39	2	D	Full	8	+	+	Secondary operation for groin nodes. Alive and well 20/12.
2	41	2	Ŋ	Full	8	+	+	Alive and well 20/12.
3	28	3	A	Full	8	+	+	Died I year; recurrence at vulvo- vaginal junction with groin nodes
4	57	ıΕ	D	Full	8	+	+	Died 10 days; massive collapse of lung. Autopsy: no growth.
5	60	2	D	Full	8	+		Alive and well 15/12.
6	36	2	Α	Full	8	+		Alive and well 14/12.
7 ×	41	2	Α	Full	8	+	_	Alive and well 12/12.
8*	50	2	Α	Full	8	+	4-	Died 12/12; lung metastases.
9*	51	I	A	Full	8	+	-	Died 5/12 following ureteric transplant for fistula. Autopsy:no growth.
10	39	2	Α	$\mathbf{Full}$	8	+	_	Alive and well 12/12.
11	33	I	Α	Full	8	÷	+ ′	Died. Abdominal recurrence 8/12.
12	56	2	A	Full	8	÷	+	Alive, no recurrence 10/12. Has metastases from concurrent breast primary.
13	<b>5</b> 3	īΕ	A	Full	8	+	_	Died 9/12. Metastases medias- tinum.
14	49	2E	A	Full	8	, +,	_	Alive and well 10/12.
15	47	2	Ā	Full	8	÷	+	Alive and well 9/12.
16	ĠΊ	2E	Α	7.	2	+	_	Died I month; pyelonephritis. Autopsy: no growth.
17	40	r	D	1	2	+	_	Alive and well 9/12.
18*	49	2	Α	į	2	+	+	Alive 9/12; fistula.
19	53	2	D	Ť	2	+	+	Alive and well 6/12.
20	55	2	Α	Į	2	+	+	Alive and well 6/12.
21	46	2	A	1.3	2	+		Died 14 days; pyelonephritis and pulmonary embolism. Autopsy: no growth.
22	57	2E	Α	1/3	2	+	+	Died 10 days pneumonia.  Autopsy: no growth.
23	бо	ı	D	2.	6		+	Alive and well 3/12.
24	54	2E	Ã	3.2	6	+	<u>.</u>	Alive and well 3/12.
25	49	2	A	7	6	+		Alive and well 3/12.
26	43	2	Ā	2	Ğ	+	+	Alive and well 3/12.
27*	36	3	A	فالبية فالإب قالب والب والب وبإب	6	+	+	Alive 3/12; fistula.
28	33	2	Α	; ?	6	÷	+	Alive and well 3/12.

(1) D—Differentiating tumour.

A-Anaplastic tumour.

(4) Presence of active tumour tissue in operation specimen.

<sup>(2)</sup> Full=full course of 2 stage modified Stockholm technique.

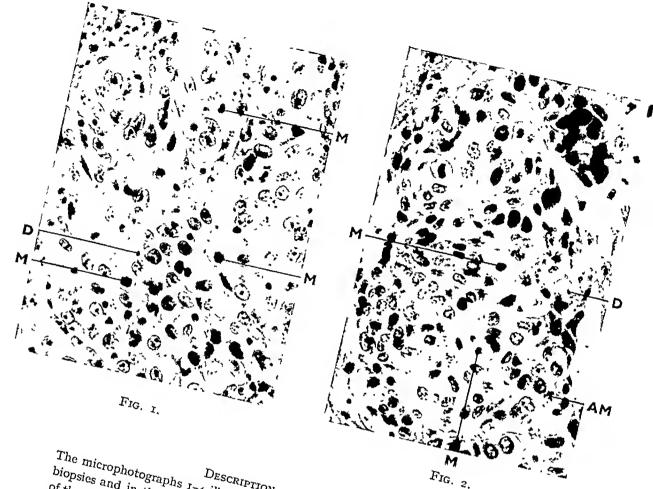
\[ \frac{1}{3} = \text{one dose of 3 stage modified Stockholm technique.} \]

\[ \frac{2}{3} = \text{two doses of 3 stage modified Stockholm technique.} \]

(3) Interval (in weeks) between radiological and surgical treatment.

<sup>\*</sup> These cases developed necrosis subsequent to operation.

<sup>†</sup> The letter E placed after the stage No. indicates that the tumour is endocervical.



The microphotographs I-4 illustrate the histological features observed in the The microphotographs 1-4 mustrate the histological reatures observed in the operation specimen taken from a patient with carcinoma patient with carcinoma of the uterine cervix, clinical stage 2 (cf. Table IV, case No. 1). Fig. 1 shows the of the uterme cervix, chinical stage 2 (ct. lable 1V, case IVO. 1). Fig. 1 snows the form a data of the first rodium incortion in offer a comparable tumour focus 7 days after the first radium insertion, i.e., after an estimated dose of good at the biopsy site. Fig. 3 illustrates the tumour mass found under the biopsy site. Fig. 3 illustrates the tumour mass found under the biopsy site. the intact mucosa 8 weeks after a full course of radium treatment, i.e., after an estimated dose of 18,000r at this site. Fig. 4 shows a comparable young tumour focus in the right external iliac lymph node.

It will be noted that apart from slight variations in cell size and from slight increases in the incidence of abnormal mitotic and of degenerating cells (cf. in Particular Fig. 2), the activity of the tumour tissue of this patient is not checked by exposure to radium. List of abbreviations:

 $AM = Ab_{normal\ mitotic\ cell.}$ M=Normal mitotic cell.  $D_{\approx}D_{\text{egenerating cell.}}$ 



Fig. 3.

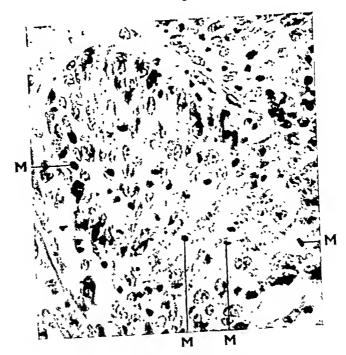


Fig. 4.

upon whom operation was attempted but could not be carried out are included then the percentage of satisfactory results to date is only 41.

The fate of the surgically treated cases. Table IV shows the results of these cases. If we use the same criteria as when dealing with the group just described we have, to date, 18 satisfactory cases, and 1 who is satisfactory as far as the cervical tumour is concerned but who has metastases from another treated primary tumour (breast), then we have 19 satisfactory cases (68 per cent) and 9 unsatisfactory.

The influence of node involvement is already apparent, for of 13 node-involved cases surviving operation, 3 are already dead, whereas of 10 cases without node involvement only 1 has, so far, died of cancer. It should be observed that operative deaths, and the remote operative death where we obtained autopsy evidence of the absence of tumour; are included in the unsatisfactory group of cases.

#### DISCUSSION.

We believe that provided (I) the tumour is of the type that responds to radiotherapy, and (2) that it is of such an extent that every part of it can be adequately irradiated, then radium can achieve more in the cure of the primary tumour than the Wertheim's operation and with less risk. If the first of these conditions is not fulfilled then surgery is the only hope of saving the patient. If the second cannot be fulfilled then possibly a combination of radium and surgery is the answer, but that is a problem beyond the scope of this paper.

Unfortunately it appears that a rather large percentage of unfavourably responding tumours are found in patients who are not best suited for a surgical attack. Of our stage I tumours, 69 per cent responded favourably, and all the cases in which we

found a favourable response were operable. In addition to this we have found a high incidence of node involvement in the unfavourably responding tumours, adverse influence of which is too well known to need repetition. It would seem that the cases known to do well with operation, namely early Wertheim's tumours without node involvement and often of a well-differentiated type, are also the cases that do well with radium. Nevertheless it does appear that surgery still has an important part to play in the treatment of carcinoma of the cervix. Bonney and others have shown that some cases with node involvement can be cured and some of our surgically treated cases at least have a chance of survival, whereas their prospects without operation were hopeless, since all had active tumour tissue present at operation. We believe, however, that it is unjustifiable to submit a patient to surgery without first determining the response of the tumour to radiation.

The time seems ripe for a new approach to this very important problem. For too long too many people have regarded surgery and radium as the methods of opposing camps. Nothing could be further from the truth. Some tumours are suitable for treatment with radium and some are not. For these latter patients surgery, at the moment, is the only alternative treatment, but there remains, unfortunately, a group of cases who are beyond the hope of either method and to find a way of dealing successfully with such patients is an urgent challenge to further combined scientific and clinical research. If, however, the other patients are to derive the maximum benefit from existing methods of treatment it is essential that the most suitable technique be selected for each individual tumour, and we believe that our approach offers a rational basis for such individualization.

#### SUMMARY.

- I. The response of individual cervical carcinomas to radiotherapy was determined by a quantitative histological analysis of serial biopsies.
- 2. An attempt was made to salvage, by surgery, patients with tumours not responding to a test dose of radiation.
- 3. Of 149 cases studied 54 gave a favourable or probably favourable response; 88 gave an unfavourable response, and in 7 the biopsy material provided was inadequate. In the 54 favourably responding cases, radium alone was used in the treatment of the primary tumour, but in a small number the regional lymph nodes were removed surgically. Of the 88 unfavourable cases 46 were initially considered suitable for Wertheim's hysterectomy, which was completed in 28 cases (Table II).
- 4. In 37 cases with unfavourably responding tumours in which the pelvic lymph

- nodes were examined microscopically, tumour tissue was present in 25. In 22 of these patients the primary tumours were in clinical stages I and 2 and the remainder in stage 3.
- 5. Though in patients with radio-incurable tumours of the cervix, the high incidence of lymph node involvement and the comparatively low operability-rate must limit the success of radical surgery, it is at present the only effective means of dealing with this type of tumour.

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### THE VASCULAR PATTERN OF THE PLACENTA AND ITS DEVELOPMENT IN THE RAT

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In his detailed investigation of the development of the rabbit's placenta, Mossman (1926) studied in particular the arrangement of both foetal and maternal bloodvessels in relation to each other, and pointed out the significance of the vascular dispositions. He had been preceded in this study by the work of Tafani (1887) who recorded the same arrangement of vessels in the placentae of the cat, dog, guinea-pig, and rabbit. Tafani, however, presented his observations without significant comment or illustration. Recently, Barcroft and Barron (1946) studied the cotyledonary placenta of the sheep, and showed that, as in the rabbit, the blood-flow in the maternal capillary bed is parallel with, but opposite in direction to, that in the foetal capillaries; they correlated their anatomical observations with the changes which occur during gestation in the oxygen-saturation of the blood passing along the umbilical vein. At the same time, direct experimental evidence was produced by Noer (1946) in support of Mossman's hypothesis on the physiological effects of this anatomical arrangement, so that this theory may be considered as definitely established. In his survey of placentation Mossman (1937) indicated that the arrangement of the foetal and maternal vessels was

determined by the mode of invasion of the allantoic villi. Unlike the rabbit, implantation in the rat is antimesometrial, although the allantoic placenta is formed on the mesometrial side of the uterus, and so it was thought that it would be of interest to see if the maternal circulation conforms to the same pattern, and, if so, how such an arrangement is established.

Many studies have already been made of the placenta and placentation in the rat and the mouse, notably that of Duval (1891). Its histology has also been well covered by Jenkinson (1902) on the glycogenic cells, both maternal and foetal, and Krehbiel (1937) on the decidual cells, in the so-called "deciduomata". Grosser (1909, 1927) and Mossman (1937) provide good surveys and bibliographies on the placenta generally. Consequently, relatively little attention is paid to many of these details in this communication.

Observations have also been made on the maternal blood-vessels in the earliest stages of placentation in the sheep as well as a few on those of the placentae of the cat and pig.

#### MATERIAL AND METHODS.

The routine injection mass consisted of dried human plasma unfit for human use.

This was reconstituted as directed on the bottles to normal concentration, using 10 to 20 per cent Indian ink instead of distilled water. The mixture was quickly filtered through cotton wool, and would keep for a considerable length of time provided that it was filtered immediately before use. It flowed easily and had the advantage over gelatin masses that it could be injected cold. On fixation the plasma proteins became coagulated in the vessels and retained the ink within them. The only drawback was that in the larger vessels, especially the veins, the mass tended to fall out on sectioning, leaving, however, a distinct black annulus around the walls of the vessels (Fig. 14). This did not occur with the smaller vessels, and so did not materially reduce the value of the technique. The rats and cats were injected through the descending aorta, the former immediately after being killed by coal gas, the latter within an hour or two of death by chloroform. The extirpated uteri of the sheep and pigs were obtained from slaughter-houses and were injected through The hydrostatic the uterine arteries. pressure used was about 100 mm. mercury. It was not found necessary to wash out the blood from the vessels before injection. When injection was considered adequate, the specimen was immersed in either 10 per cent unneutralized formalin or Bouin's fixative for 24 hours: the uteri were then removed from the cats and rats and replaced in the fixative for 24 hours, or until required. Blocks of the uteri or placentae were embedded in celloidin, sectioned at thicknesses of 40 to 100µ and stained lightly with haematoxylin, neutral red, saffranin or Biebrich scarlet. With the pig uteri, as well as sections cut in celloidin, several free-hand sections of about 200-200 were cut, dehydrated, cleared in oil of wintergreen and examined under the binocular microscope. Some sections were also cut

at 5 and 10µ in paraffin, and stained with Delafield's haematoxylin and eosin or iron haematoxylin. A complete series of histological preparations of rat placentae, stained with haematoxylin and eosin, was also used.

In the case of the rat, the ages of the embryos were accurately known. Daily vaginal smears were taken, as described by Long and Evans (1922), and a male was placed in the cage overnight when the female was coming on heat. Next morning, the female was examined for signs of a vaginal plug or sperms in the smear. The females were then killed at the desired stage. With all the other animals no histories were available and size of embryo was the only guide to age.

With some of the rat uteri in the earlier stages of gestation, the injection of Indian ink was followed by the injection of a sus-

TABLE I.

INDED I.						
	Age of embryos in days	Injected specimens	Uninjected specimens			
RATS	Non-pregnant 7 8 9 10 11 12 13 14 15 16 17 18 19 20	R18 R17 R16	W245 R22 W286 W285 W283 W277 W243 W251 W289 W294 W234 W250 W227 W275 W299 W296 W274 W304			
Ѕнеер	,	10 mm. 10 mm. 27 mm. 28 mm. 31.5 mm.	17 mm. 20 mm.			

pension of starch granules which filled the arteries. The starch was subsequently stained in the sections with iodine, and thus provided a differential injection of the arteries and veins. In later stages, however, this technique was not used as considerable quantities of starch passed into the venous circulation. Details of the material used are listed in Table I.

In addition there were 2 injected and 1 uninjected barren uteri, and an injected uterus which contained a blastocyst of moderate dimensions, which were unfortunately not recorded.

#### CAT.

The material consisted of 5 injected uteri, 2 non-pregnant and 3 each containing 5 foetuses, the average crown-rump lengths being 93, 108 and 116 mm., i.e., near term.

#### Prg.

The material consisted of several barren uteri and I pregnant uterus containing II foetuses of crown-rump length 70 mm. (one a cyclops), as well as 2 macerated and partially resorbed foetuses.

#### THE RAT.

Gross arrangement of uterine blood-The uterine artery runs in the vessels. mesometrium parallel with, and about 5-10 mm. distant from, the uterine horn, and anastomoses cranially with the ovarian artery supplying the Fallopian tube. The uterus receives its blood-supply by a series of arteries—about 12 in number—which spring from the uterine artery, at right angles to it, in a regular series, and pass towards the uterus. Shortly before reaching it each of these vessels divides into two or three branches which join those from the neighbouring arteries to form an anastomosing arcade alongside the uterus, from

which a host of small arteries spring at all levels to supply this organ. The blood-supply is rich and the veins which accompany the arteries very prominent. The pattern is quite characteristic and is easily distinguished from that of the intestine.

The non-pregnant uterus. The outer longitudinal and inner circular muscle coats are clearly defined. Whereas the latter completely encircles the uterus, the former extends out into the mesometrium for about 2 mm, and then comes to an abrupt end (Fig. 1). The tissue between these 2 layers of longitudinal muscle consists of a stroma similar to that within the endometrium, but interspersed with Within it are the muscle fibres. numerous small arteries or arterioles which supply the uterus, as well as the much larger and less frequent uterine veins, which join with those from the opposite side of the uterus between the two muscle layers. At the limit of the muscle, this tissue becomes transformed abruptly into the fat-laden cells of the mesometrium. During pregnancy, the uterus swells considerably, and these two layers of longitudinal muscle are gradually taken up into the uterine walls, whilst the intervening tissue hypertrophies and takes part in the formation of the "noyau mediomusculaire " (Duval) or the " myometrial gland " of most other authors, which appears as a prominent bulge on the mesometrial side of the uterus in the latter third of pregnancy.

The arteries, entering the uterus between these two layers of longitudinal muscle, continue in a tightly spiralled manner around its wall, between the muscle coats, anastomosing antimesometrially (Fig. 1). They send branches outwards through the longitudinal muscle, supplying it and forming loops under the serous coat. More numerous branches also pass radially through the circular muscle, and enter the

outer, or basal, part of the endometrium. So far, these branches are coiled, but, as they pass inwards, they become straight, and almost reach the uterine epithelium before they break up into a terminal capillary plexus underneath it (Figs. 1 and 2). At the mesometrial side of the uterus, these inwardly-directed arteries are more numerous and pass into the stroma through the circular muscle, which is somewhat thicker at this point, directly from the "muscular" mesometrium.

These latter arteries present an interesting appearance in the injected specimen, Rr8. The injection mass is apparent right up to the circular muscle, and then it almost disappears where the arteries lie within the muscle, promptly reappearing when they reach the uterine stroma. Although this phenomenon may be due to an agonal postmortem contraction of the muscle (or contraction induced by fixation) it suggests the possibility of a sphincteric action on these vessels by the circular muscle, and will be considered later.

The veins within the uterus are very voluminous; the main ones lie in the outer or basal part of the endometrium, close to the circular muscle. Much smaller veins, draining the longitudinal muscle and serosa, accompany the arteries between the muscle coats. The large veins pierce the circular muscle obliquely, shortly before reaching the mesometrial attachment to the uterus (Fig. 1).

In the resting state the uterine epithelium is cubical or low columnar and thrown into large folds. The thickness of the sub-epithelial tissue of the endometrium is about 800 µ at the crests of the folds, and 400 µ at the troughs. It is somewhat thinner on the mesometrial side, since the lumen of the uterus is eccentrically disposed in that direction. The uterine glands, neither as numerous nor as complicated as in most mammals, lie in the stroma on the lateral

and antimesometrial parts of the uterus, and are absent in the mesometrial quadrant. There is thus a strip of tissue running down the mesometrial border of the uterus. definitive allanto-placenta where the will form, devoid of glands, but containing a compact leash of straight arteries running right through it from the underlying muscle to the epithelium (Fig. 2). In these two characteristics it is reminiscent of, though not so clearly demarcated as, the extremely specialized implantation areas in the bovine uterus. During oestrus, the uterus is distended by fluid, and the endometrium becomes stretched. The stroma is then about 200p in thickness laterally, chiefly due to the presence of the glands, but only 100% mesometrially and antimesometrially. The uterine epithelium becomes very tall at ocstrus.

Seventh day of pregnancy. By this stage, the embryo has reached its final position in the uterus and has implanted; the decidual reactions around it are well established. The stroma of the uterus, or decidua as it may now be called, increases enormously around the embryo, on the lateral and antimesometrial sides of the uterus. As a result, the uterine lumen is greatly reduced in calibre, and appears to be displaced towards the mesometrial side. The embryo then lies at the antimesometrial end of a long narrow pit which runs horizontally across the uterus from the antimesometrial to the mesometrial side, its mouth opening mesometrially into the narrowed uterine lumen. In a longitudinal section of the pregnant uterus, cut parallel to a line joining its mesometrial and antimesometrial sides, the narrow uterine cavity and implantation pit, within the decidua, resemble a capital T laid on its side. The crosspiece of the T represents the slit-like lumen which unites the unrestricted regions of the uterine cavity between the implantation sites; throughout

most of its extent it is exceedingly narrow (and is soon obliterated in later stages) but in the middle it is more expansive and, from here, the vertical limb of the T, representing the implantation pit, extends away towards the antimesometrial side; in its extremity lies the embryo (Fig. 3): compare with Duval (1891, Figs. 85-87) and Grosser (1927, Fig. 127). In his Fig. 86 Duval illustrates a fold ("plis") or papilla, labelled P, projecting into the uterine lumen, opposite the mouth of the implantation pit, which he claims (page 40) takes a part in the obliteration of the uterine "Ces plis . . . contribuent à lumen: produire . . . la sondure de ces deux régions opposées de la muqueuse, de manière à oblitérer le canal utérin au niveau de chaque loge contenant un oeuf." In our sections of the present and two succeeding stages, however, this papilla shows distinct signs of degeneration. The epithelium covering it is not as tall as elsewhere and stains more deeply. The nuclei are large and dark, and occupy most of the cell body, extending from the base to the free The cells of the stroma within the papilla degenerate, during the 8th day, into a homogenous eosinophilic mass containing a number of pyknotic nuclei; this retracts from the surrounding tissues (Fig. 6).

The vascular pattern of the decidua has now changed considerably. Owing to the decidual reaction, the diameter of the uterus in the mesometric-antimesometric direction has increased considerably. As a result, the main orientation of the prominent vessels is parallel to this elongation and to the walls of the implantation pit. The arteries piercing the circular muscle at all points, and formerly passing through the stroma to the subepithelial plexus, are now difficult to find. Even on the mesometrial side, elongated parallel to the implantation pit, the subepithelial plexus

is dilated, increased in depth, becoming sinusoidal, prominent and engorged; in places this plexus has ruptured and released the injection mass into the lumen. This is partly due to the rather higher pressure used to produce a satisfactory injection of these earlier stages. However, as there would seem to be a normal leakage of blood through the epithelium lining the pit into the lumen about this stage, the ink in the lumen does, to some extent, represent a normal phenomenon. The embryo itself is surrounded by a zone of tissue which is virtually avascular; this corresponds to the primary decidual zone of Krehbiel (1937, Fig. 1D) who has described in detail the cytological changes taking place during the early stages of pregnancy. The large veins, lying just within the circular muscle and in the basal part of the uterine stroma, which is as yet relatively unchanged, are also dilated and prominent and show an occasional rupture. The vascular changes at this stage consist of capillary and venous dilatation and increase, together with relative insignificance of the arteries within the circle of tissue enclosed by the circular muscle. The pattern of the circulation is largely dependent on a distension of the uterus in the mesometrial-antimesometrial direction. Between the implantation sites, there is a general increase in vascularity, both arterial and venous but affecting particularly the smaller vessels and capillaries.

Eighth day of pregnancy. The general dispositions at this stage, as seen on transverse section, are shown in Diagram I. It is of interest to note that in the particular implantation from R22 which was used as the basis of the diagram, the embryo has implanted the wrong way round. The ectoplacental cone or Träger is well developed, as is the inverted yolk-sac; the first signs of the proamniotic cavity are also present. In fact, the embryo appears quite

normal for this stage of development (see Huber, 1915, Figs. 26 and 27). Nevertheless, the whole embryo is so orientated that the Träger is facing away from the mesometrium instead of towards it, whereas the germinal mass, "suspended" in the yolksac, is directed mesometrially. It is difficult to visualize how this embryo could have developed a successfully functioning placenta on the antimesometrial side of the uterus, for the decidual reaction does not appear to differ in any respect from the other implantation sites in the same uterus, in which the embryo has orientated itself in the usual direction. This observation is in conformity with the work done on the "deciduomata" which can be produced -by artificial stimuli in the uteri of rats and other animals. It has been shown that the stimulus provided by the embryo for the initiation of the decidual reaction is not a specific one, but can be reproduced by a variety of means. Consequently, the malorientation of this particular embryo would not be expected to have, and, in fact, does not have, any effect on the development of the decidua. Because of the apparent improbability of a placenta being formed in this case, the embryo would have died about the 11th or 12th day. Hence, incorrect orientation of the blastocyst, with reference to the implantation site, would seem to be a contributory factor to intrauterine mortality, but to what extent it is impossible to say. Malpresentation of the embryo at term is a well-recognized cause of foetal mortality but malposition of the blastocyst at implantation does not appear to have been recognized previously.

At this particular stage the whole of the decidual tissue presents three fairly obvious zones (Diagram I). The first occupies the antimesometrial half of the uterus, and almost encircles the embryo; the second occupies the mesometrial half, and surrounds the constricted uterine lumen, and

the third is a narrow, transverse band between the other two zones, bordering on the side of the implantation pit (Grosser, 1927, Fig. 130). The first zone is the "decidua capsúlaris" and the remaining two comprise the "decidua basalis."

The capsularis, called the "caduque réfléchie '' by Duval, and roughly equivalent to the secondary decidual zone of Krehbiel (1927) at this stage, is composed of a very compact mass of cells, superficially resembling liver tissue. The cells are moderately large, and tend to be oval rather than polygonal. Close to the antimesometrial pole of the embryo some of the cells have become involved in the degenerative changes taking place in the epithelial and subepithelial tissues (implantation zone of Krehbiel). This zone is surrounded by a narrow band of uninuclear cells which is the primary decidual zone, now much reduced: outside that is an annulus of very tightly packed cells, many of them binuclear, and many more in mitosis. These nuclei are large, and usually demonstrate two distinct nucleoli. cytoplasm stains lightly with eosin, and is very finely granular. The capsularis is bounded and separated from the circular muscle by a narrow strip of almost completely unchanged uterine stroma (Krehbiel's basal zone) in which the remains of the compressed glands of the resting uterus may still be seen. The line of demarcation between the capsularis and the basal zone shows a layer of flattened decidual cells, orientated parallel to this line and staining somewhat more deeply than the rest. They increase in number and prominence in later stages.

The second and third zones, comprising together the "decidua basalis" (Duval's "caduque serotine"), are equivalent respectively to Krehbiel's "central area of the mesometrial region" and "glycogenic area and sinusoids". The chief distinction

between the two zones at this stage is that the narrow, third zone has prominent vacuoles in the cells and contains-large sinusoids: later the second zone also takes on these characters and the whole of the basalis becomes uniform in appearance. The cells of the basalis do not show so marked a change from the parent stromal cells, when compared with the cells of the capsularis. They are fairly compact, especially around the implantation pit, where they are flattened parallel to the long axis of the pit (Jenkinson's layer of vacuolated and flattened cells, labelled "v.f.c." in his diagrams). The nuclei are large, with a distinct nucleolus, and the cytoplasm is scanty, clear and slightly basophilic; as already pointed out, cells with the prominent vacuoles indicative of glycogen formation have appeared in the most antimesometrial part of the basilis (Krehbiel, Fig. 1E). The uterine lumen and, in particular, the implantation pit are now very narrow; the latter exhibits three regions, more or less corresponding to the three zones previously described (Fig. 3). The one remote from the mesometrium contains the embryo  $(Z_1)$ , and the cavity and epithelium of this part have been obliterated by its expansion. The intermediate region has almost completely lost its epithelium, which has been shed into the lumen  $(Z_2)$ . Here it has mingled with some decidual cells and with blood which has leaked out of the sinusoids nearest to the epithelium, to form a coagulum—the maternal symplasma. The region nearest the uterine lumen retains its epithelium. which is still of a low columnar type, like that of the adjoining lumen  $(Z_3)$ .

The vascular changes show a distinct advance on the previous day (see diagram). Whereas the capsularis is relatively avascular, showing very few vessels other than capillaries, the basalis is riddled with venous sinusoids, which are largest in the

adjacent glycogenic zone (Fig. 4). arteries which pierced the circular muscle directly from the mesometrium in the barren uterus are visible again, especially at the level of the implantation pit. At first they pursue a coiled course through the basalis, but then become straight, and bifurcate close to the degenerating papilla previously described (Figs. 5 and 6). At this stage these arterioles have a diameter of 15-20µ. The two branches pass around the uterine lumen, and join the much increased subepithelial plexus bordering the implantation pit. From this the blood passes laterally into the veins which formerly drained this plexus, now dilated into sinusoids scattered throughout the basilis, especially the glycogenic portion, they eventually drain into the veins lying against the circular muscle; and thence into the uterine veins in the mesometrium. The veins within the uterus often form a "collar" or "halo" around the ingoing arteries, and, in both injected and noninjected specimens, show leakage of blood (or ink) into this basal, outer part of the decidua basalis. It may be noted that the implantation axis, i.e. the line of the incoming arteries and the implantation pit. rarely passes through the middle of the attachment of the mesometrium to the uterus, but invariably to one side or the other of it (Diagrams I and II). Thus, it would seem that implantation is not strictly antimesometrial, but slightly lateral, although only in very small degree.

As already mentioned the capsularis is very poorly supplied by blood in comparison with the basalis; the only vessels seen are capillaries winding amongst its packed cells. These are fed by a few small arteries piercing the circular muscle obliquely from the antimesometrial side of the uterus, and traversing the unchanged basal zone to reach the capsularis. Most of them drain into the nearest sinusoids of

the basalis; few veins, or venules, can be seen leaving the capsularis.

Both in the sinusoids of the basalis and the capillaries of the capsularis, leucocytes are present in relatively large numbers; in the former they mostly lie close to the walls of the vessels. Some leucocytes lie free amongst the cells of the capsularis. These observations suggest that the circulation through the uterus at this stage is slow and sluggish.

Ninth day. The decidua capsularis shows relatively little change from the previous day; it is now clearly demarcated from the basal zone without and the embryonic cells within by the layers of flattened elongated cells before mentioned, and the region of transition to the glycogenic area of the basalis is now quite abrupt. however, has made embryo, great advances; it has increased considerably in size. The ectoplacental cone (Duval) or Träger is well formed and prominent. The cavities of the ectoplacenta and amnion are quite distinct from each other, but still in communication by a narrow neck across the exocoelom (see Diagram II and Grosser (1927, Fig. 131)). The bud of allantoic mesoderm protrudes into the exocoelom. The yolk-sac presents visceral and parietal walls (proximal and distal of Duval) and around these Reichert's membrane (Duval's "cuticule ectodermique") and the layer of giant cells, variously called the "central zone" (Everett, 1935), the "cellules ectodermiques géantes" derived from the "ectoderme distal" (Duval), and "Durchdringungszone" (Grosser, 1927). The first blood islands can be seen in the splanchnopleure of the yolk-sac wall. The cells of the central zone, immersed in maternal blood which has leaked into this part of the implantation pit (Duval's " cavité de la caduque ") are of two types. The more numerous are relatively small cells, with pale cytoplasm, dark nucleus

and rounded cell body. The remainder, few in number, are typically giant cells; both cell-body and nucleus are large, the nucleus is granular, and the cytoplasm presents angular, outstretched processes suggesting the possibility of amoeboid action. Most of these giant cells are closely applied to the decidua.

The Trager presents the appearance of a sharp-pointed cone, with an outer layer of giant cells adjacent to the maternal tissues. and within this its syncytial mass or ectoplacental cone, together with the distinctly cellular part bounding the ectoplacental cavity. The apex of the "cone" is thrusting into the mass of symplasma and blood in the implantation pit, and already lacunae containing maternal blood can be seen within it (Fig. 7). The vacuolation, indicating the presence of glycogen, has spread further mesometrially in the basalis, so that about half now presents this appearance. The uterine lumen is markedly reduced, the epithelium surrounding it is still intact, whereas all that lining the implantation pit has disintegrated and, in the cavity of the pit, mingles with the blood which has leaked in from underlying sinuses, some of which have probably ruptured spontaneously, others due to the ingress of the Träger. The latter is advancing along the line of the pit, now marked by a broad streak of symplasma, disrupting this and eroding adjacent sinusoids in the process.

The vascular arrangments delineated in the previous stage are now clearly marked (Fig. 7). Two or three prominent arteries pierce the circular muscle at the mesometrium, and run up to the uterine lumen before bifurcating, whilst the other arteries supply the outer part of the decidua basalis. Apart from these special arteries mesometrially, all others within the ring of the muscular coat have disappeared. Already in the former the first signs of the cells generally called "swollen endothelium"

can be seen. Whether these cells are really endothelial, or of a decidual origin, replacing the true endothelium, is uncertain, for similar reactions may be observed in scattered decidual cells in the close vicinity of the vessels. However, the early onset of this phenomenon, definitely under way at the next stage, suggests that the cells are unlikely to be derived from embryonic sources, for they are appearing at distances at present considerably removed from the nearest embryonic cells of the Träger. This view is at variance with that of Pritchard (1947) who believes the "swollen endothelial" cells in the metrial gland region to be of foetal origin on account of their high alkaline phosphatase content. On the 11th day, however, he speaks of the endothelium of the maternal blood-vessels in the basalis as being stained intensely by Gomori's method for phosphatase. It is not clear from his account that adequate distinction is made between the "swollen endothelial "cells of the maternal vessels and the cells of the trophoblast which line the central "artery" of the placenta from about the 12th day till term. These swollen cells clearly delineate the arteries, which are by now about 35\mu in diameter. The sinusoids are greatly increased in number and size, particularly near the Träger; many of them have ruptured, releasing blood into the symplasma and into the lacunae of the Träger. The capsularis is slightly more vascular, as its capillaries are somewhat larger. It is quite easy to discern that a number of them communicate with, and discharge their blood into, the spaces of the central zone, as the sinusoids release their blood amongst the giant cells overlying the Träger, which are directly continuous with those of the central zone. The distant endothelium of these capillaries ceases abruptly where they open into the central zone. In all the injected specimens of this stage the central zone is considerably distended and

the cells widely separated (Fig. 7). The area contains large quantities of maternal blood, with little Indian ink. In spite of what may happen in later stages (see Everett, 1935), this suggests that at present there is no circulation of blood among the cells of the central zone, it having seeped in from ruptured vessels, as it does into the Träger and into the trophoblastic lacunae in the human. Probably the injection pressure has been fairly uniform throughout most of the vessels, and so almost certainly higher than the normal blood pressure here. As a result, much blood, followed by some injection mass, has been driven into the central zone by the pressure, from which it cannot escape as the circulatory pathway has not yet been established; hence, it has accumulated here, and caused swelling of the central zone. Later, when a circulation has been established, this does not occur. Leucocytes are still present in considerable numbers in most vessels.

Tenth day. The uterine lumen is now showing the first signs of re-establishing itself on the antimesometrial side of the uterus (Fig. 8 & Diagram III). This takes place by a splitting of the line of junction between the basal zone and the laver of flattened cells bounding the decidua capsularis, the former forming the new layer of uterine stroma on the antimesometrial side of the uterus. Sometimes a very thin layer of the stroma of the basal zone remains on the decidua; although uterine epithelium covers over the basal zone at once, it never clothes the capsularis. The latter is now decidedly thinner than before, largely due to mechanical distension by the embryo. At its junction peripherally with the basalis, the glycogenic vacuolation has extended into it for a short distance, and the venous sinusoids have extended into the same area.

The body of the embryo is now formed. The neural tube shows the brain vesicles, and has closed in the mid-dorsal region, although still open anteriorly and posteriorly. Heart and pharynx are well developed, but the mid-gut is widely open to the yolk-sac. Limb buds are present and there are many blood islands on the yolk-sac. The ectoplacental cavity has been obliterated, and the allantoic mesoderm just comes into contact with the underside of the ectoplacental cone ("lamina" of Everett). The cone has now broadened its base, so that relative to the previous stage it appears flattened; nevertheless, it has continued to extend in a mesometrial direction.

Almost all the basalis is now vacuolated. It is difficult to find traces of the old uterine lumen which formerly passed through this region. The incoming arteries are distinct, and generally there are two main ones to each placental region. Although, for convenience, the term "artery" is retained for these vascular channels throughout this account, the sole justification for this usage from this stage onwards is the direction of flow of the contained blood, for they lose all trace of an arterial or arteriolar wall, and become increasingly voluminous. In these arteries, whose average diameter is about 50-55\mu, the "endothelial" reaction is now distinct, particularly in their terminal portions; the cells are large and round and the cytoplasm stains a peculiar glassy pale blue in haematoxylin and eosin sections (Figs. 9 & 10). In the terminal parts of the arteries they form a complete wall, but in the outer, coiled, parts they alternate with areas of apparently normal endothelial cells. According to Selve and McKeown (1935) these cells are endothelial, but are a part of the nutritional complex formed by the decidua basalis and the myometrial gland for the nutrition of the embryo and are shed into the lumen of the arteries. This suggests that they may be the same as the maternal glycogenic cells which Jenkinson

(1902) describes floating free in the placental lacunae. No observations have been made upon this point. The trophoblastic giant cells of the Träger are now approaching the site of the old uterine lumen, and have virtually reopened and occupied the implantation pit in its mesometrial half. Consequently, instead of running parallel to each other as before (Diagram I), the branches of the arteries now diverge approximately at right angles, and pass along parallel with, and close to, the margin of the giant cells (Diagram III). As a result the sinusoids come to be directed towards the mesometrium rather than laterally; the appearance of the maternal circulation, as seen in a transverse section, suggests a "fountain" arrangement, with the blood passing straight up the arteries in the centre, and then in a cascade outwards and downwards towards the uterine veins. A considerable amount of maternal blood is incorporated in the trophoblastic part of the placenta, and, judging by the quantity of injection mass found amongst the cells of the central zone, the blood is beginning to circulate freely through the area.

Eleventh day. The decidua capsularis is considerably attenuated, and the uterine lumen around it is almost completely reestablished. The thickness of the central zone, i.e. from Reichert's membrane to the inner face of the capsularis, is unchanged. The cells in the central zone have all been converted into giant cells.

The Träger has broadened even further and the inversion of its margins is quite evident, carrying with them a part of Reichert's membrane and the distal wall of the yolk-sac on to the embryonic face of the placenta, with the resultant formation of an entodermal sinus. The apex of the ectoplacental cone has become rounded off, so that the trophoblastic cells are assuming the form of a flattened mass. Consequently, the decidua basalis is partially divided into

two halves along the line of the old implantation pit; these have been "splayed" apart by the invasion of the foetal part of the placenta, so that the interface between the trophoblastic giant cells and the decidual cells runs more or less transversely across the uterus, presenting a convexity towards the mesometrium (see Grosser (1927, Fig. 135)). The allantoic vessels and mesoderm are commencing their invasion of the ectoplacenta from the foetal side, and from now on it is possible to divide the foetal placenta into three parts. First, the labyrinth nearest the foetus which contains both maternal and foetal blood streams; outside that, the plasmodial reticularis, which later becomes glycogenic, and is never vascularized from foetal sources; finally, abutting on the maternal tissues, a layer of giant cells. Duval, whose observations were made chiefly on the mouse, states that the original layer of giant cells covering the ectoplacental cone is pierced by its expansion, and thrust laterally on to its sides, and that later a second generation of giant cells is formed from the underlying reticularis. In the present preparations of rat uteri, giant cells occur on the outside of the foetal placenta throughout term, although they are, in later stages, few in number, much flattened and attenuated. At this stage they are actively engaged in the invasion of the maternal sinusoids surrounding the main terminal branches of the maternal arteries (Fig. 11) and incorporating them within the foetal placenta.

The maternal arteries are further increased in diameter, to about 75µ. However, in the straight terminal part of their course, near the trophoblastic cells, the lumen of the vessels is almost completely obliterated by the swollen "endothelial" cells. The basal outer portions of the arteries are still somewhat coiled. Because of the lateral displacement of the decidua basalis, their main terminal branches run almost

transversely across the uterus, just within the foetal part of the placenta, and the general direction of the sinusoids is now towards the mesometrium; they are thus becoming parallel with the arteries, but the blood streams in the two sets of vessels are opposite. Thus the pattern of the maternal placental circulation is clearly indicated and it can be seen that it will conform to the pattern already described in other animals.

Twelfth day. The uterine lumen has completely re-established itself on the antimesometrial side of the uterus. The decidua capsularis is extremely thin, and degenerating throughout, the cells being strongly eosinophilic. In places the central zone is almost exposed to the lumen. It is now a compact layer of giant cells, amongst which maternal blood circulates, in direct contact with the outer surface of Reichert's membrane. Everett's (1935) work would indicate that it is a rapid circulation, and that it takes an important part in the nutrition of the embryo at this stage. The embryo has developed pharyngeal pouches and a lens pit. The optic vesicle has partially invaginated to form the cup, but there is still a distinct cavity left, which is continuous with the cavity of the brain through a widely open optic stalk. Villi and folds now appear on the proximal wall of the yolk-sac, especially near the allantoic placenta. In the labyrinth, the main "villi" of allantoic mesoderm, with their foetal vessels, are well developed, and the labyrinth and labyrinthine circulations definitely established. These villi are already arranged in a radiate manner, centring on the attachment of the allantoic stalk or umbilical cord to the inner face of the placenta.

The basalis has entered upon its state of decline. It is reduced in thickness, partly due to further invasion by the trophoblast, but also to some extent by a diminution of its glycogen content, as indicated by decreased vacuolation.

In some of the injected specimens at this stage it is only possible to identify one big maternal placental artery. The maternal arteries now terminate within the labyrinth of the placenta in two or more large sinuslike branches which radiate outwards. These arteries are coiled in the mesometrium and in the developing "myometrial gland "tissue, but become straight as soon as they penetrate the rather loosened and indistinct layer of circular muscle. The part of the artery within the foetal placenta is rather wider than that not yet incorporated and has a diameter of about 125\mu. It has lost all its "swollen endothelium", and is lined simply by cells of the trophoblast, as are all the maternal blood spaces in the foetal placenta. The reaction of the "endothelium" however, has spread to involve those parts of the arteries within the mesometrial zone of attachment to the uterus, amongst the metrial "gland" tissue ("insertion zone" of Selve and McKeown).

As mentioned above, the arteries bifurcate and pass over laterally into large sinuses within the placenta. These sinuses deliver their blood into the maternal blood spaces in the labyrinthine part of the placenta, through which the blood percolates towards the mesometrium, emptying eventually into the uterine veins. A prominent feature in injected specimens of later stages is the pool of maternal blood surrounding each of the main allantoic "villi". These maternal blood spaces are derived from the big sinus-like branches of the arteries, and the blood in them flows through the placenta around these main villi into the sinusoids in the reticularis and the basalis. Hence, the flow of this maternal blood is parallel with, and in the same direction as, the flow of the blood in the arteries of these main "villi"; consequently it must be opposite in direction to the foetal blood which passes out of these

arteries into the foetal capillaries and flows back towards the radicles of the umbilical veins at the attachment of the umbilical cord to the placenta.

Thirteenth and fourteenth days. At this stage the distal, or parietal, wall of the yolksac together with what remains of the decidua capsularis commences to disintegrate. The capsularis is little more than a syncytial sheet of degenerate cytoplasm in which the nuclei of the cells remain embedded. The central zone, likewise, is very much thinner than heretofore, but still contains an appreciable amount of maternal blood. Reichert's membrane is very distinct and appears to be intact in all except one specimen. Blood (or ink) is seen in the uterine lumen in the 14-day specimens and comes from the central zone through the capsularis, particularly near the margins of the definitive placenta, where the blood sinuses in the central zone are larger and looser. This is in essential agreement with Stafford's (1930) observations on the origin of the blood of the "placental sign" of Long and Evans (1920). The vitelline epithelium on the proximal wall of the yolk-sac now shows well-formed villi, especially where it faces the inner surface of the placenta.

The re-established uterine lumen is beginning to undermine the margins of the placenta, by splitting the decidua basalis. The newly formed uterine epithelium which clothes the wall of the new lumen is folded, and the cells are tall and finely vacuolated. The underlying stroma is very vascular and the glands have re-formed.

In the placental area, the decidua basalis, considerably reduced, has lost most of its glycogen and is clearly degenerating. The distension of the uterus by the growing foetus, however, has caused great thinning of the muscle coats; over the mesometrial area the circular muscle has become much broken up and hard to define as a layer by

the formation and development of the "myometrial gland". The "gland" tissue thus is more or less continuous with that of the decidua, and resembles the decidua basalis of the earlier stages, as its cells are commencing to show the glycogen vacuoles. The foetal part of the placenta has further increased in size and more than half its bulk is formed by the labyrinth. The reticularis is also beginning to accumulate glycogen but shows little increase in thickness as compared with former stages. The giant cells form a very thin and compact, but apparently continuous, layer. The cells become rather spindle-shaped, because of tight packing. Both nucleus and cytoplasm are pale; the nuclei show one or two nucleoli. The maternal arterial channels are considerably increased in dimensions, possessing a diameter of about 200µ (Fig. 12). These arteries, one or two in each placenta, are quite straight, and extend right through its whole thickness to terminate in a subchorial position; here they give rise to two or three sinuses, almost as large as the parent arteries, which radiate laterally, also in a subchorial position, and dwindle away by giving rise to the prominent blood spaces around the main villi of the placenta. The entodermal sheaths of these villi, which Duval described (his "entoderme ectoplacentaire" derived from the "sinus entodermique"), can be seen clearly, becoming more and more prominent towards term. Apart from these main maternal blood channels, all the large lacunae and sinusoids of the previous stages have been broken up by the trophoblast, thus forming the most intricate maze in the labyrinthine part of the placenta. foetal vessels are beginning to contain mature non-nucleated erythrocytes.

In the decidua basalis the sinusoids which are draining the placenta and emptying the blood into the uterine veins are large and numerous, honeycombing the decidua, but they appear compressed and slit-like on section. At this stage the reticularis is virtually free from large sinusoids. In that part of their course through the myometrial gland the placental arteries still show a distinct "endothelial reaction", but elsewhere this has disappeared. The fully developed placental circulation has been established. The course of the maternal blood through the channels of the labyrinth is from the foetal to the maternal side, whereas the blood in the foetal capillaries flows from the termination of the allantoic arteries on the maternal side of the labyrinth towards the umbilical veins in the body stalk. Thus, the flow of the foetal and maternal blood streams is in fact parallel and opposite in direction, and the whole pattern and arrangement corresponds closely to that in the rabbit described by Mossman (1926). Further changes are largely an elaboration and increase of the extent of this condition, and, later, are directed towards the detachment of the placenta at the termination of pregnancy.

Fifteenth and sixteenth days. No great changes occur in this stage, but the processes already seen in the early periods of development continue. The distal wall of the yolk-sac has ruptured and retracted to the margin of the placenta, forming a "zone résiduelle" (Duval), in which the thickened remnant of Reichert's membrane can be distinguished. Thus, the cavity of the yolk-sac becomes directly continuous with that of the uterus, and the epithelium of its proximal wall lies against that of the uterus. The villi on the yolk-sac become more highly developed, and reach relatively great lengths on that part of the vitelline epithelium which abuts on to the foetal aspect of the placenta.

The decidua basalis is reduced to a very narrow and compact layer, except for a thicker collar of tissue around the maternal arteries. The laborinth is further elaborated

and extremely vascular, being a vast honeycomb of blood from both sources. The maternal arteries are increasing rapidly in size; in the 16-day specimens, only one artery, as a rule, can be discerned (Fig. 13). It is uncertain whether this is due to coalescence of the two arteries present in earlier stages, or disappearance of one of them. The former is more likely since these "arteries" are in reality only large blood channels through the trophoblast, with no real walls of their own. The large, slitshaped sinusoids which lay in the decidua in the previous stage are now being surrounded by the giant cells and coming to lie in the reticularis, which contains much glycogen; thus, all parts of the maternal circulation, right up to the venous channels which pass through the circular muscle into the uterine veins in the mesometrium, are now within the foetal placenta. In these sinusoids free cells can be seen floating; Jenkinson (1902) has claimed that these are maternal glycogenic cells. Frequently small groups of giant cells can be seen lying just within the reticularis, the expansion of which cuts them off from the surface of the foetal placenta.

Seventeenth and eighteenth days. By the close of this stage the placenta has attained its maximum size and development. Both the reticularis and layer of giant cells are beginning to be reduced; the former is losing its glycogen and shrinking, the latter becoming very thin and incomplete (Diagram IV). In the labyrinth, the trophoblastic cells are becoming flattened, and spread out upon the walls of the foetal capillaries in the form of cytoplasmic plates with prominent nuclei, thus giving rise to the appearance of the haemo-endothelial type of placenta (see Mossman, 1926, 1937; also Bremer, 1916). The "villi" bearing the foetal arteries are very large and both the contained arteries and the entodermal sheaths are prominent. They extend to the

junction of the labyrinth and reticularis. The foetal red blood cell's are adult in appearance.

The maternal artery (again generally only one at this stage) is a voluminous structure, and has attained a diameter of 1 mm., or even more, on the 18th day (Fig. 14). It can be seen easily by the naked eye in the sections of the uninjected as well as the injected placentae.

The process of separation of the placenta from the uterine wall by the re-formation of the uterine lumen has proceeded apace, and the placenta now lies virtually free in the uterus, attached to the mesometrial part of the uterine wall only by a broad pedicle formed of the remains of the decidua. This process of separation of the placenta from the uterus occurs at such a plane that all the large venous spaces lie on the placental side of the cleft, amongst the giant cells and the outer part of the reticularis. These coalesce to form a circular venous sinus around the outer, maternal aspect of the placenta, draining all the maternal blood from the placenta, and in its turn emptying into the uterine veins in the mesometrium, through the "pedicle" around the artery. At the margins of the placenta there is an area involving the giant cells and part of the reticularis undergoing hyaline de-This increases considerably generation. towards term.

Nineteenth and twentieth days. This final period does little more than show an elaboration of the processes at work in the previous stage. Almost the whole bulk of the placenta is formed by the labyrinth. The reticularis, very much reduced and shrunken, has given place to the annular venous sinus already described. However, it is somewhat thicker at the margin of the placenta and it also persists as a sheath around the maternal artery through most of its course within the labyrinth (Fig. 15). Islands of reticular cells can be seen in-

corporated within the labyrinth; the giant cells, likewise, have almost disappeared except at the lateral edge of the placenta.

The "pedicle" attaching the placenta to the uterine wall is still narrower and contains almost all that remains of the decidua. At this point the artery shows a slight constriction but elsewhere is undiminished with no other signs as yet of occlusion in preparation for the impending parturition (Fig. 16). In one injected 20-day placenta, which still presented two arteries, a third channel resembling an artery, but smaller, lay between them. This channel passed vertically through the placenta, and communicated with the venous sinuses draining it within the pedicle. This would seem to be an anomalous venous channel draining some of the maternal blood. This observation may help to explain Duval's repeated statement that the large central vessels of the placenta are efferent, i.e. they are venous, transporting maternal blood away from the placenta. This is not the usual arrangement.

In conclusion it will be seen that at implantation the earliest vascular changes in the rat's uterus consist of sinusoidal dilatation of the capillaries and veins of the endometrium with but little reaction on the part of the uterine arteries. This at first is mainly limited to the glycogenic zone of the decidua basalis, and both sinusoidal dilatation and the glycogenic zone develop pari passu. This stage is reached about the 10th day of pregnancy, by which time the uterine lumen is being re-established in the region of the decidua capsularis, which has exhibited throughout this period a much less intense vascular reaction than the decidua basalis. At this stage small groups of radially running arteries on the mesometrial side of the uterus opposite each implantation pit commence to dilate and become conspicuous, whilst the Träger occupies the whole implantation pit and

approaches the old uterine lumen and the site of bifurcation of these arteries.

Toth day onward From the phenomena which lead to the establishment of the final vascular relations within the placenta proceed rapidly. These consist of broadening of the Träger, leading to opening out of the implantation pit and splaying of its walls laterally and toward the mesometrium; of progressive replacement of the decidua basalis by trophoblast which also invades the sinusoids in this region, the maternal blood channels, both arterial and venous, becoming incorporated within the foetal part of the placenta. These blood channels lose their original walls and become bounded everywhere by foetal tissue. The original two or three radial arteries supplying the placenta thus merge into a single large central channel, the branches of which pass laterally and horizontally as large sinuses in a subchorial position. From these the blood drains backwards along the main villi and towards the mesometrial half of the uterus. It is also at this stage that the foetal portion of the placenta becomes vascularized from allantoic mesoderm.

These processes proceed until about the 17th or 18th day, when the placenta has attained its maximum development. Meantime the new uterine lumen, re-established on the antimesometrial side at the 10th day, has progressed towards the mesometrial side, undermining the placenta and leaving this attached to the uterine wall by a progressively narrowing pedicle through which pass the main maternal vascular channels supplying and draining the placenta. This process is clearly in preparation for the impending parturition, as is the narrowing and enhanced irritability of the artery entering the placental pedicle.

#### THE SHEEP.

Barcroft and Barron (1946) have studied

the form and arrangement of the circulations in the placenta of the sheep, correlating changes in the gaseous tensions of the blood of the umbilical veins with the changes in the disposition of the foetal and maternal vessels. In so far as the established placenta is concerned there is nothing to add to their account, but their description of the vascular condition in the barren uterus and the mode of early penetration of the foetal villi into the uterine burr is open to criticism.

The material used consists of sheep foetuses and uteri from an abattoir and contains many specimens of a later age than those listed in Table I. Great difficulty has been found in maintaining the foetal membranes in contact with the uterine wall while the blocks of tissue were being impregnated with celloidin, and even preliminary embedding in gelatin has not been completely successful in overcoming this difficulty. However, the observations are not invalidated by this fact.

The tentative copulation ages awarded to the various stages are based on the table in Assheton's monograph on the sheep placenta (1905, p. 207), to which work Barcroft and Barron make no reference.

The non-pregnant uterus. The uterus which contains a free blastocyst will also be considered under this heading as it presents no fundamental or important changes from the barren state. significant points save one the observations tally with those of Bancroft and Barron, and so the conditions obtaining in the uterine burr or cotyledon alone will be discussed. The uterine vessels to the burr are large, prominent, and arranged in spirals in the tissue between the uterine muscle and the base of the burr proper. From the arteries, a number of branches arise which form tight "corkscrew" spirals running into the base of the burr, where they in turn often subdivide further into

two or three branches (Fig. 17). The stroma of this part of the cotyledon is especially dense, and as they pass through it, the arteries lose the greater parts of their coats. and are difficult to see when not injected. They run straight towards the inner free surface of the cotyledon, and, as Barcroft and Barron point out, appear to be constricted and might better be called arterioles. They give off very few, if any, branches as they pass through the cotyledon until, when nearly at the epithelium, they break up into a spray of relatively large capillaries. These form a dense network of blood-vessels in the subepithelial stroma, which is most loose here, and many capillaries appear to contact the bases of the epithelial cells of the mucosa. A small number of arteries also enter the cotyledon at its periphery from the glandular part of the uterus. The capillary loops, turning back on themselves, gradually unite to form veins at about the junction of the superficial and middle thirds of the burr; these are more voluminous than the arteries, and pass out into the large uterine veins underlying the burr. No trace of the venous sinus described by Barcroft and Barron as immediately underlying the uterine epithelium has been seen in any of these specimens. Even the specimen of early pregnancy only shows a general dilatation of the vessels in the burr and under the epithe-Although Barcroft and Barron (p. 579) say that "Immediately beneath the basement membrane of the epithelium there is a very rich venous plexus, amounting to a sinus, which covers virtually the entire cotyledonary surface ", and illustrate this [Plate 1, Fig. 3], in their summary (p. 591) they make no mention of a sinus and speak only of a subepithelial capillary plexus, as described here. As will be seen later this so-called "sinus" is probably an Assheton (1905) and Marshall (1903) make no reference to any such

structure, which, having a depth of more than 200µ, would probably be noticed even in uninjected specimens. According to Barcroft and Barron, this sinus is invaded during implantation; it is unlikely that Assheton would have omitted mention of it in his close study of implantation if he had in fact seen it. Moreover, any epithelium which was floating directly on a lake of blood 200µ deep would be leading a very precarious existence and would be under constant threat of rupture with loss of appreciable amounts of blood into the uterine lumen.

Some observations of Marshall (1903) may help to explain the "presence" of this "sinus". During the period of pro-oestrus and oestrus in the sheep, the superficial subepithelial capillaries dilate and rupture into the surrounding stroma and sometimes even through the epithelium into the uterine cavity. His Plate 7, Figs. 3 and 4, illustrate these points. According to their list Barcroft and Barrón had only one non-pregnant uterus in their series, possibly at this stage of the oestrus cycle, so that the injected mass passed out of the weakened and ruptured capillaries into the surrounding, relatively loose, uterine stroma, producing the "venous sinus". Their illustration appears consonant with this interpretation. The hydrostatic pressure by itself is unlikely to explain the anomaly; two barren uteri injected at a pressure of 250 mm. of mercury in order to test this point only showed some small scattered irregular ruptures, totally unlike the "sinus".

The pigment, although variable in amount and distribution, is usually very dense in the cotyledons, and largely concentrated in the layer of stroma just underneath the epithelium (Fig. 17); it also lies scattered in the middle depths of the cotyledon, especially around the vessels. Assheton differentiates this latter pigment from that more superficially placed,

because of its lighter colour. Granules of pigment may also be seen in the epithelium. Marshall claims that the pigment is derived from the blood released from the capillaries during oestrus, but Assheton was unable to elicit a positive reaction for iron from it. Treatment of the sections with potassium permanganate and sulphurous acid bleaches the pigment to a very light brown, leaving the injected vessels showing more distinctly and indicating that the pigment may be allied to melanin.

10 mm. Stage. (About twenty days old.) The foetal membranes in both specimens are just commencing to invade the cotyledon; they have removed or displaced the epithelium and exposed the underlying stroma and capillary plexus. Only very occasionally, here and there, is there as yet an "erosion" of the stroma. There is no sign of any venous sinus, or of any ruptured vessels. The diplokaryocytes of Assheton are distinct, forming a discontinuous, irregular layer on the surface of the stroma. The views of Barcroft and Barron are difficult to reconcile with those of Assheton. who claimed that these diplokaryocytes, which persist to term, originate from the trophoblast. The "crypts" are probably artefacts due to shrinking of Wharton's jelly after fixation. Barcroft and Barron do not discuss this, nor do they consider the views expressed by Mossman (1937) on the fate of the uterine epithelium in the ungulate placenta, namely, that much of it persists to term.

Prominent in these sections is a distension of the veins, and a generally increased vascularity of the cotyledon. These cotyledonary veins commence to enlarge about a quarter of the way in from the surface of the cotyledon, but as many of the superficial capillaries are also dilated to the size of venules, the veins often appear to start right at the surface of the cotyledon, where they are exposed by the loss of the epithe-

lium. The deeper veins are irregular in shape and loosely and tortuously coiled, whilst at the periphery they tend to aggregate in bunches. They finally pass out of the cotyledon towards the midpoint of the base to drain into the underlying vessels of the uterus, which are also dilated. In the deeper parts of the cotyledon, there has now appeared a loose network of fine and incompletely injected vessels, mostly veins, not formerly visible.

The arteries have also dilated and become more distinct in the cotyledon, but not to the same extent as the veins. They, too, show enlarged terminal branches running right to the exposed surfaces. They are still straight and unbranched in the cotyledon, but as they enter the base, it can be seen clearly that they arise in leashes of two or three from coiled branches of the main arteries underlying the cotyledon. The latter has expanded, and presents a slightly concave face to the uterine lumen, so that now its margins appear curved up and undermined for some distance by the glandular tissue; the latter has not yet commenced to migrate over the sides of the cotyledon.

17 and 20 mm. (About thirty to thirtyfive days old.) At this age the chorion is commencing to penetrate into the loose superficial stroma of the cotyledon; the "villi", if such they can be called, are very broad and the pits or crypts which they produce are shallow but wide. All the superficial capillaries are dilated and almost sinusoidal; some are quite devoid of any stromal or epithelial covering on that part of their circumference adjacent to the foetal chorion. However, despite this fact, there are very few ruptures of these capillary vessels; they do not undergo the process of disintegration of the surrounding stroma, but are "pushed aside" by the chorionic villi. There is no evidence that the villi are invading the veins

or venous capillaries. Certainly, at this stage, the primordial villi have a considerably greater breadth than the veins. In the depths of the cotyledons, the arteries are relaxed and open, not tightly constricted as before. The endothelium, to which Barcroft and Barron refer, is still prominent; the coats of the larger arteries are somewhat thicker than before.

27 and 28 mm. (About forty days old.)

These two specimens present a crucial stage; the villi have penetrated some distance into the cotyledon (about a fifth of its depth), although the membranes are The most important still detachable. changes involve the superficial plexus, which is now extremely prominent (Fig. 18). All the capillaries have dilated and become sinusoidal, and form a very close-meshed and dense plexus. Furthermore, this plexus has deepened to the same extent as that to which the adjacent villi have penetrated. In other words, both the villi and the dilated and increased plexus occupy just the same extent of the cotyledon in which they lie. The plexus shows a number of ruptures, mostly small, localized, and not necessarily bearing a close relation to the villi. Once again, the villi during their entry into the cotyledon displace the sinusoids laterally, rather than attacking them or the veins draining them. There does not seem to be any convincing evidence either at this or any other stage for the statement by Barcroft and Barron (p. 581) that "when the disintegrating has extended to a level which exposes the veins leading to the cotyledonary depths . . . the cavities of these veins are invaded by the villi ".

Within the cotyledons, the arteries are now as prominent as the veins, and tend to be very slightly coiled in their basal portions (Fig. 19). Large arteries and veins extend right into the superficial plexus, where they are quickly lost amidst the

maze of sinusoids, to which their branches (or tributaries) contribute.

31.5 mm. (About forty-five days old.) This stage corresponds to Barcroft and Barron's four animals in the 43- to 48-day group, the earliest pregnancies listed in their table. The villi have rapidly expanded their depth of invasion, and penetrated nearly the whole thickness of the cotyledons, so that implantation is virtually accomplished. The pattern of the circulation is now as described by Barcroft and Barron. The arteries, large and quite distinct, run straight through the cotyledons toward the foetal surface, where they break up into capillary vessels. These arteries are always ensheathed in a layer of cotyledonary stroma, separating them from the foetal trophoblast; the capillaries lie in the stroma, forming a network around the whole length of the artery. The arteries contribute a number of side branches into this plexus as well as their main terminal branches. Near and around the tips of the villi, these capillary networks converge to form the veins draining out of the cotyledon. Apart from these basal veins, it is difficult to find any other veins within the cotyledon. Nevertheless, this is not due to villous invasion and obliteration of these veins. If the villi had grown down the veins, blood would surround the villi, and the veins in the uninvaded parts of the cotyledon would be in communication with the venous channels containing the villi. The histological picture of the cotyledon does not show any significant traces of extravasated blood round the villi, especially their tips, at any stage, apart from the later pools of blood around their bases, clearly described by Assheton, which appear only after implantation has been completed. Furthermore, the veins issuing from the cotyledon do not bear any very intimate relation to the tips of the villi, nor do they arise from the villous "crypts" which appear in the

fixed specimens, probably because of the shrinkage of Wharton's jelly; instead, they arise from capillaries lying in the cotyledonary stroma between the tips of the villi.

The cotyledonary veins which have apparently disappeared are in reality incorporated within the sinusoidal network in the fully formed placenta. At the 10 mm. stage, a plexus of fine capillaries opens up throughout the cotyledon, so that there is a capillary network in its depths as well as the more prominent one at its surface; secondly, coextensive with the depth of invasion of the cotyledon by the villi, this deeper capillary network enlarges, expands and becomes sinusoidal (27-28 mm.), whilst the commencement of the veins within this network becomes inconspicuous. As the villi continue to penetrate the cotyledons, so the neighbouring small capillaries dilate to sinusoidal capillaries, and, as a result, the veins cease to be prominent and become a part of the network pervading the cotyledons, only their terminations draining out of the cotyledons remaining distinctly recognizable as veins. The distinction between capillaries and venules is lost, due to the sinusoidal dilatation of the former.

#### THE CAT.

The non-pregnant uterus shows the same basic pattern as the cotyledons of the sheep and the uterus of the pig. The arteries lie, as in the rat, between the two muscle coats and are fairly tightly coiled. The veins are relatively small in the uterus and accompany the arteries for the most part. In this situation the latter give off radially-directed branches through the circular muscle running straight up to the epithelium. Here they break up into a capillary plexus which is then drained by small veins towards the muscle and into the main uterine veins. The endometrium is poorly vascularized, especially when com-

pared with that of the dog, which possesses the same pattern, but is much richer in blood-vessels. Our material fully confirms the observations of Tafani (1887) on the disposition of the vessels within the It consists almost entirely of placenta. foetal. maternal tissue; tissues represented solely by the vessels and by a thin layer, abutting on the uterine muscle, which consists largely of the dilated ends of the uterine glands. The maternal arterial channels, very large and straight, pass through this zone from the uterine arteries, and pursue a straight course towards the foetal surface of the placenta (Fig. 20). They are enclosed by a thick layer of trophoblast, which makes them very distinctive. About half-way through the placenta each of these arteries, previously running singly, divides into two or three branches (Figs. 21 and 22) which continue to the foetal surface in close proximity to each other (horizontal sections). Here, they turn at right angles to lie parallel with this surface, and run round the placenta at right angles to the long axis of the uterus and parallel to the borders of the placenta (Figs. 23 and 24). They lie close to the main foetal arteries, separated from them only by trophoblast. The foetal arteries also encircle the inner face of the placenta, parallel with the maternal ones. Beyond their point of bifurcation, the

Beyond their point of bifurcation, the maternal arteries continually give off side branches whilst travelling towards and lying immediately under the foetal surface of the placenta. All these vessels, most of them little bigger than capillaries, turn back towards the uterine wall, running parallel with the parent arteries to enter into a most complex mesh of capillary vessels. This is mainly disposed perpendicular to the surfaces of the placenta, alongside a similar arrangement of foetal vessels, so that a "horizontal" section of the placenta, i.e. one parallel with its

surfaces, reveals a most intricate maze of alternating injected and non-injected capillaries, separated only by trophoblast.

Some of the branches of that of the artery lying under the foetal surface of the placenta are rather larger than the rest, and, after a very short course, open into small sinuses which lie near this surface. These "venous sinuses " are then drained by capillaries or venules which join the general capillary This arrangement is slightly plexus. reminiscent of Schlegel's (1946) description of "arteriovenous anastomoses" in the human endometrium, apart from the fact that the branches of the arteries in the cat, corresponding to his "arterioles" entering the sinuses, are much bigger, and possess no coats, other than a covering of tropho-

Near the uterine wall the capillary plexus collects into venules which drain into a number of irregular sinuses lying amongst the remnants of the uterine glands and thence into the uterine veins. As Tafani showed, the foetal vessels possess the same arrangement, i.e. the arteries run towards the maternal surface, and there break up into a capillary meshwork which drains in the reverse direction back to the foetus. Consequently, the blood streams in the capillary systems follow parallel but opposite courses. The foetal arteries are neither as large nor as prominent as the maternal ones, possibly because they possess well-developed coats.

A dog's uterus containing 30 mm. embryos shows a very similar pattern to that of the cat, though not, at that stage, so fully developed.

## THE PIG.

The pig possesses a very vascular uterus. The branches of the uterine artery pass to alternate sides of the uterine horn in a fairly regular series. As they encircle the uterine horn these arteries are tightly coiled

and lie at first immediately under the peritoneum, gradually piercing the muscular coats obliquely to lie in the endometrium, where they dwindle away on the antimesometrial side of the uterus. As they pierce the muscle coats, they give rise to a number of small arteries which run around the uterus for some distance between the muscular layers, which they supply.

From the main arteries a series of radial branches arise which run towards the lumen of the uterus, terminating in an exceedingly rich capillary plexus immediately underneath the epithelium (Fig. 25). This plexus is so dense that, to the naked eye, the celloidin sections (40µ) show a distinct, heavy, continuous black margin along the epithelial surface. This plexus is drained by an intertwined system of veins which present a widely branched arboreal appearance (Fig. 26). Radicles of these veins run for considerable distances under the epithelium and its plexus, receiving numerous small tributaries from the latter. These radicles then join to form the larger trunks, which pursue a meandering course to the main vessels, also coiled and tortuous, lying just within the muscle coats. Because of their widespread tributaries the territories of these veins draining the subepithelial plexus overlap to a considerable extent.

Around each gland there is a delicate capillary lacework, supplied and drained by small vessels, generally from the basal vessels. In the pregnant uterus the most outstanding change is a considerable, generalized enlargement of all parts of the venous circulation, with an increase in the superficial capillary net. The veins, distended and very prominent, are all coiled and tortuous, and the main basal ones are quite cavernous; some are irregularly valved. The early stages of pregnancy in the sow greatly resemble the conditions in the sheep and the arterial dilatation is

insignificant as compared with that of the veins.

#### DISCUSSION:

In the placenta of the rat and other mammals studied, the courses of the maternal and foetal circulations are parallel, but the direction of flow is opposite. As Mossman (1926) has postulated and Noer (1947) has demonstrated, this arrangement is best suited to an efficient interchange of diffusible substances across the placental barrier.

The maternal vessels in the uterus play a relatively passive part in the development of this circulation; the arrangement of the vessels in the non-pregnant uterus already presents the main features of the placental There, a capillary plexus circulation. underlies the uterine epithelium, supplied by arterial blood flowing towards the uterine lumen, and drained by veins whose blood flows outwards, parallel with but opposite to the arterial flow. When pregnancy supervenes, one or two chosen arteries enlarge to maintain the supply of the capillary plexus, while the rest soon disappear; the capillaries and veins dilate and are invaded and broken up to form a sinusoidal circulation by the foetal placenta. Thus the definitive maternal placental circulation is formed by the activity of the ectodermal trophoblastic cells of the Träger. the maternal blood channels playing a relatively passive role. To illustrate this, the length as opposed to the breadth of the maternal placental arterial channels has been measured in each specimen. The length of the vessels in the early stages so obtained is only approximate as they are coiled; the measurement has been taken from the inner surface of the circular muscle to the point of bifurcation close by the uterine lumen. Moreover, any slight obliquity in cutting the sections introduces an additional (small) error. Nevertheless,

allowing for these factors, fully developed arterial channels in the 18-day placentae are hardly any longer than the arteries of the 8-day stage from which they have been derived. Obviously, some contribution to their intra-labyrinthine extent must have been made in order to keep pace with the centripetal growth of the main mesodermal villi of the placenta, but this is barely detectable because of the crudity of the measurements. These observations indicate that after the earliest stages of pregnancy (i.e. after the 8th day) the maternal placental arteries hardly grow in length. The changes in their location, from lying entirely in the decidua basalis on the mesometrial side of the uterine lumen to being incorporated within the foetal placenta, terminating in a subchorial position, is not due to growth of arterial channels themselves, but to the activity of the trophoblast in surrounding and encapsulating these relatively static and passive arteries. The mode of invasion of the trophoblast by the vascular allantoic villi ensures that the foetal circulation in the placenta shall be parallel with but opposite in direction from that of the mother.

As a result, the pattern of the maternal circulation has an "umbrella" or "fountain" appearance - that is, the arterial blood "ascends" through the centre of the placenta to the foetal surface, where it and "cascades" radiates laterally, (through the labyrinth) on all sides, to be collected by the bigger venous sinuses on the lateral and maternal aspects of the placenta, and drained away. Duval's (1891) assertion that the central placental vessels of the rat and mouse are efferent, i.e., venous, is incorrect; in the arrangement of their placental vessels these two rodents correspond with other known members of that order. According to Wislocki and Streeter (1938), the platyrrhine monkeys resemble the rodents in the

distribution of the maternal vessels in the placenta. Hill's (1932) description of the placental circulation in Tarsius also presents points of similarity to our studies, such as a large central maternal artery. Hence, the vascular pattern possesses a wide distribution in mammals.

Certain interesting changes, however, do take place in the maternal circulation at implantation. When implantation is taking place in the rat on the 7th day, the capillaries and veins dilate to become sinusoidal, whilst the arteries are difficult to see and, presumably, constricted and in spasm. The sheep resembles this at the 10 mm. stage. This condition of the circulation can be, and probably is, aided by the circular muscle, since it can, by its contraction, prevent both the ingress and egress of blood to the endometrium, without affecting the circulation through the main arteries outside this layer. This spasm of the arteries probably also occurs in the human, since it is very difficult to find them near the early implanted ovum (Ramsey, 1938), whereas dilated venules are quite noticeable. The restriction of the arterial blood flow with its reactive venous dilatation creates a stagnation of blood in the uterus, which condition the implanting ovum would seem to require. It means that when the superficial capillaries and sinusoids are ruptured, there will not be a considerable escape of blood under pressure, but a gentle percolation of blood into the lacunar spaces of the trophoblast; later, when the ovum is firmly implanted, the arteries open and a true circulation of the maternal blood through the trophoblastic region commences (about the 10th day in the rat, 27-28 mm. or earlier in the sheep); this is very easily demonstrated in the central zone of the rat's trophoblast, where at first the blood is not circulating, but merely infiltrating from the neighbouring ruptured capillaries. The number of leucocytes within the sinus-

## KEY TO DIAGRAMS AND FIGURES.

A.—Artery.

A.L.M.—Allantoic mesoderm.

A.M.—Amnion.

C.M.—Circular muscle.

C.Z.-Central zone.

C.Z.M.—Central zone of the mesometrial region (Krehbiel).

D.C.—Decidua capsularis.

E.-Embryo.

F.V.—Foetal (allantoic) vessels.

G.—Uterine glands.

G.B.—Capillary plexus around a uterine gland.

G.Z.—Glycogenic zone.

1.P.—Implantation pit.

L.-Uterine lumen.

L.M.—Longitudinal muscle.

M.—Mesometrium.

M.U.—Muscle coat of uterus.

P.—Papilla.

P.S.—Placental venous sinuses (maternal).

P.Y.S.-Proximal wall of yolk-sac.

R.U.—Re-established uterine lumen.

S.—Venous sinusoids.

Tr.—Träger.

U.C.-Umbilical cord.

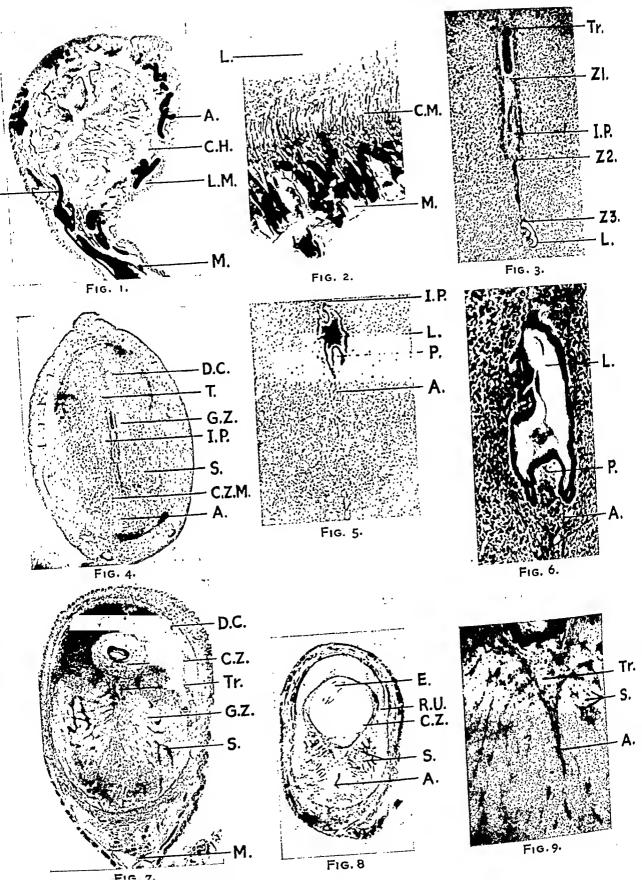
U.V.--Uterine veins.

V.-Vein.

Vi.-" Villus" of giant cells.

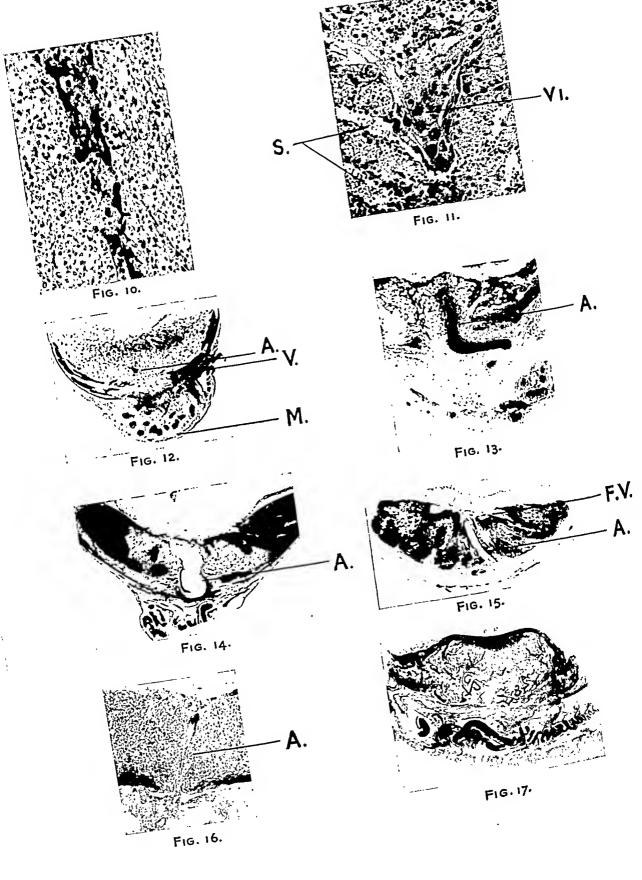
Y.S.-Yolk-sac.

Z<sub>1</sub>, Z<sub>2</sub>, Z<sub>3</sub>—Zones in the implantation pit.



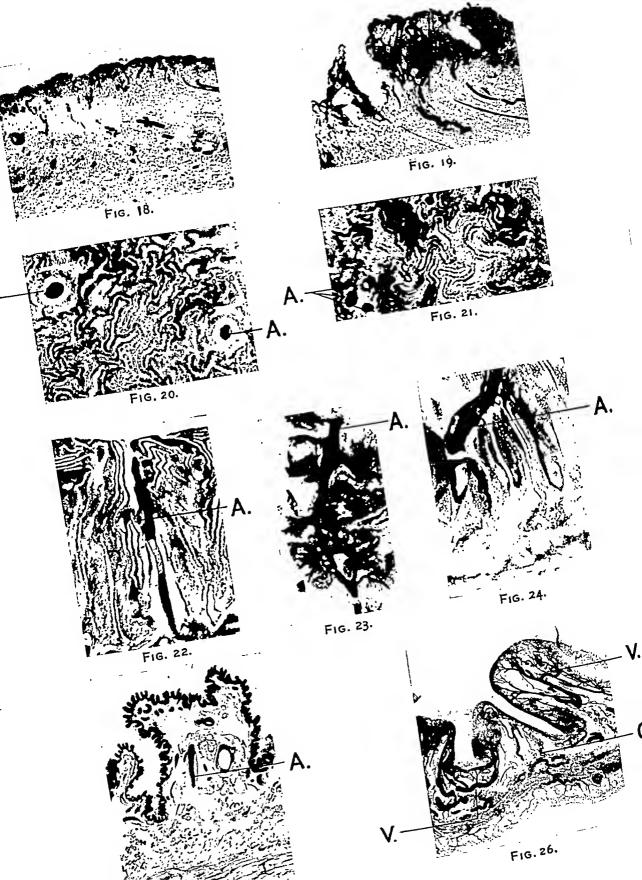
#### PLATE I.

- Fig. 1—Transverse section of the uterus of a non-pregnant rat (R18); the vessels are injected with Indian ink. Note the spiral arteries between the muscle layers and the radially arranged branches passing inwards towards the uterine epithelium. A single large vein is shown draining from the basal part of the endometrium into the mesometrium. The extension of the longitudinal muscle into the mesometrium can also be seen. × 15.
- Fig. 2—Sagittal section of the uterus of a non-pregnant rat (R18). This section has passed through the attachment of the mesometrium to the uterus. The vessels are injected with Indian ink and the radially arranged arteries passing inward towards the epithelium are particularly distinct on the mesometrial side. ×25.
- Fig. 3—Section through an implantation pit on the 8th day of pregnancy in the rat (R22). Note the malorientation of the embryo and the zones  $(Z_1, Z_2, Z_3)$  described in the implantation pit at this stage. These zones are labelled at their mesometrial extremities. Stained with haematoxylin and eosin.  $\times 30$ .
- Fig. 4—Transverse section of the uterus of a rat (R22) on the 8th day of pregnancy. The section passes through the embryo and implantation pit. Note the venous sinusoids in the decidua basalis and glycogenic zone, and one of the radially coursing arteries (A) in the basal part of the endometrium. Stained with haematoxylin and eosin. × 12.
- Fig. 5—Section of the rat's uterus (R22) on the 8th day of pregnancy, showing the degeneration in the papilla opposite the mesometrial ext emity of the implantation pit with one o. the radially coursing arteries of the endometrium approaching it. Stained with haematoxylin and eosin. ×45.
- Fig. 6—High-power view of the degenerating tissue in the papilla facing the implantation pit on the 8th day of pregnancy in the rat (R22). Stained with haematoxylin and eosin. ×98.
- Fig. 7—Transverse section of the uterus of a rat on the 9th day of pregnancy. The maternal blood-vessels are injected with Indian ink. The injected venous sinuses in the glycogenic zone of the decidua basalis are clearly shown, whilst the absence of injection mass from the central zone and its distension with maternal blood is significant. ×9.
- Fig. 8—Section of the uterus of a rat (Rii) on the roth day of pregnancy. The maternal blood-vessels are injected with Indian ink. The uterine lumen is being re-established. The Träger shows further development and the ingoing maternal artery can be seen. The venous sinusoids of the basilis are being turned by the expanding Träger so as to be directed towards the mesometrium. ×6.
- Fig. 9—Section showing the Träger and one of the maternal placental arteries in a rat (W283) at 10¼ days pregnancy. The branches of the artery and the venous sinuses are clearly delineated. Stained with haematoxylin and eosin. ×20.



#### PLATE II.

- Fig. 10—A high-power view of the wall of the artery seen in the preceding figure to show the endothelial reaction. Stained with haematoxylin and eosin. x12.
- Fig. 11—Section of the placental area in a rat (W277) at the 11th day of pregnancy to show the invasion of the venous sinuses by a "villus". Stained with haematoxylin and eosin.  $\times$  98.
- Fig. 12—Placenta of the rat on the 13th day of pregnancy. The maternal blood-vessels have been injected with Indian ink. Note the central artery (A) approaching the base of the placenta and the large vessels in the mesometrium, together with the venous sinuses draining the placenta. ×8.
- Fig. 13—Central portion of the placenta of a rat at 16 days' pregnancy to show the central artery entering its base. The maternal vessels have been injected with Indian ink. × 14.
- Fig. 14—Central portion of the placenta of a rat (Rio) at the 18th day of pregnancy to show the central artery of the placenta. Note that the draining venous sinuses are directed peripherally from the foetal surface of the placenta.
- The maternal vessels are incompletely injected with Indian ink, and the injection mass has come out of the central artery (A) during preparation.  $\times 6$ .
- Fig. 15—Section of the placenta of the rat (R14) at 19 days. The maternal vessels and sinuses have been injected with India ink. This has been followed by a starch injection mass to fill the central artery (A). ×15.
- Fig. 16—Section of the placenta of a rat (W296) at 19 days to show the narrowing of the central artery (A) as it passes through the muscle coat of the uterus to enter the base of the placenta. Stained with haematoxylin and eosin.  $\times 10$ .
- Fig. 17—Transverse section of a burr from the uterus of a sheep containing a free blastocyst. The blood-vessels have been injected with Indian ink. Note the spiral vessels at the base of the burr. The fine capillaries close to the free surface are obscured by pigment. ×6.



#### PLATE III.

- Fig. 18—Transverse section through a burr from the uterus of a sheep containing a 27 mm. embryo. The maternal blood-vessels have been injected with Indian ink. The epithelium covering the burr has been destroyed and the chorion (detached from the specimen) has commenced to penetrate into the burr. Note the sinusoidal dilatation of the superficial capillaries. This specimen was taken from the tubal extremity of the uterine horn. ×38.
- Fig. 19—Transverse section through one of the more central burrs in the same uterus as that shown in fig. 18. The foetal membranes have become detached but the excavations produced by the chorion are distinct. The further dilatation of the capillaries proceeding with the attachment of the membranes is shown and the lack of any extravasation of the injection mass into the uterine lumen is significant. ×38.
- Fig. 20—Section of a cat's placenta near term. The plane of the section is parallel to the foetal surface and close to the basal part of the organ. The maternal blood-vessels have been injected with Indian ink. The main maternal arterial channels (A) are shown in section, coursing singly towards the foetal surface. The pattern of the maternal capillaries around the foetal trabeculae is also well shown. × 19.
- Fig. 21—Section from the same placenta as and parallel with that shown in Fig. 20 but through the luminal half of the organ. The branches (A) of the arteries shown in the previous figure are clearly seen. × 18.
- Fig. 22—Transverse section of a cat's placenta near term showing one of the maternal arteries (A) coursing towards the foetal surface and supplying capillaries and sinuses around the foetal trabeculae. The latter course backwards toward the uterine wall. The clear area on the main artery shows its site of bifurcation. The maternal vessels are injected with Indian ink. × 15.
- Fig. 23—Section of a cat's placenta close to term parallel to and at the foetal surface of the organ showing a large maternal artery (A) running along the surface and giving its branches laterally and outwards to form the capillaries and sinuses around the foetal trabeculae. The maternal vessels are injected with Indian ink. × 19.
- Fig. 24—Transverse section of the cat's placenta near term showing a maternal artery (A) turning to run parallel to the foetal surface of the organ and giving off its branches backwards towards the uterine wall. The maternal vessels are injected with Indian ink.  $\times$  19.
- Fig. 25—Transverse section of the uterus of a pregnant sow in which the vessels have been injected with Indian ink to show the dense capillary plexus immediately under the epithelium. One of the radial arteries (A) supplying this plexus is also shown.  $\times 15$ .
- Fig. 26—Transverse section of the uterus of a pregnant sow in which the blood-vessels have been injected with Indian ink. The subepithelial plexus and its draining veins (V) are well shown. Note also the blood supply of the serous coat and of a gland (G.B.). ×7.

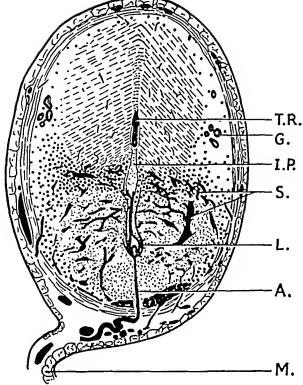


DIAGRAM I.

Diagram to illustrate the vascular arrangements in the uterus of the rat at the 8th day of pregnancy based on the serial sections of specimen R22. Note the malorientation of the embryo.

Decidua capsularis is hatched. Decidua basalis is stippled, the glycogenic zone being coarsely stippled and the central area of the myometrial region (Krehbiel) finely stippled.

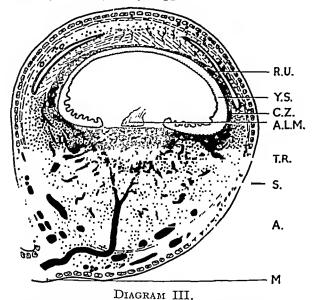


Diagram of the foetal membranes, decidual zones and vascular arrangements in the uterus of the rat on the 10th day of pregnancy.

Decidua capsularis hatched; glycogenic zone coarsely stippled; central zone of the mesometrial region (Krehbiel) finely stippled.

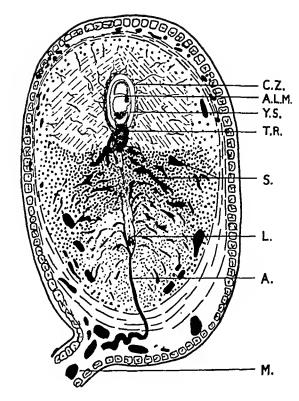


DIAGRAM II.

Diagram to illustrate the vascular arrangements and the decidual zones in the uterus of a rat at the 9th day of pregnancy.

Decidua capsularis, hatched; glycogenic zone coarsely stippled; central zone of mesometrial region (Krehbiel) finely stippled.

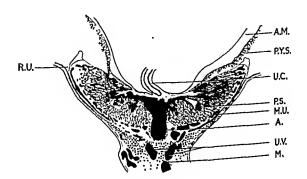


DIAGRAM IV.

Diagram of the foetal membranes and vascular arrangements in the placenta of the rat at the 18th day of pregnancy.

The myometrial gland is coarsely stippled.

oids of the basalis on the 8th and 9th days are indicative of a slow and sluggish circulation. Moreover, the degenerating "papilla" of stroma and epithelium, facing the mouth of the implantation pit on the 7th to 9th day in the rat, presents definite evidence for the arterial spasm. The arteries come from the mesometrium. through the circular muscle and very close to the underside of this papilla, before bifurcating and continuing into the superficial capillary plexus on either side of the implantation pit. This papilla represents the central point of the field supplied by the arteries. When they go into spasm it seems probable that the whole of the blood supply to the area of the papilla is cut off, with the result that it undergoes degeneration. The phenomena of oedema followed by epithelial and subepithelial sloughing of the endometrium during implantation is known in many species, including the primates, and is almost certainly consequent on vascular changes in the underlying tissues. Mossman (1937) discusses this.

In at least three species (rat, sheep, human) implantation is characterized by arterial spasm with capillary and venous dilatation and engorgement, giving the implanting embryo the opportunity establishing its vascular relations with a static pool of blood at low pressure, thus reducing the risk of embryonic damage which might result from a blood stream flowing along under pressure. In the pig where there is no real implantation of foetal tissues within the uterine wall, the maternal blood-vessels remain continuously in this stage of post-arterial dilatation. Although Goldstein (1926) has indicated the importance of the glandular secretions and areolae in the nutrition of the pig embryo, both he and Amoroso (1947) have shown that the foetal blood stream penetrates the trophoblast and comes into very close relationship with the uterine tissues, so that the pig's placenta might be called epithelio-endothelial. These studies, together with those of Flexner and Gellhorn (1942), indicate that there is nevertheless a considerable transference of materials across the placenta directly from the one blood stream to the other. In the latter half of pregnancy, the arterial channels in the placenta become large and dilated, especially in the rat, but also in the sheep and cat. This almost certainly results in a fall of blood pressure and a reduction in the rate of flow in the wide, placental, arterial channels. The prolongation of the time taken by the maternal blood to circulate through the labyrinth allows a more complete exchange between the foetal and maternal blood As regards the fall in blood pressure, it can only be assumed that the pressure must be approximately equal in the maternal and foetal blood streams within the labyrinth. Excessive pressure on the maternal side would presumably lead to collapse of the foetal capillaries. These facts may be relevant to some of the work of Huggett and Pritchard (1945) and Pritchard and Huggett (1947). They found that if the foetus was killed before the allantoic mesoderm had reached placenta, the latter was killed by maternal haemorrhages, whereas after the invasion of the mesoderm into the placenta foetal death was not followed by placental death, but the foetal blood-vessels in the placenta were obliterated. According to Barcroft (1946), the umbilical arterial pressures continue to rise throughout most of pregnancy, whilst the venous pressures-remain more or less fixed. Although the assumption that data obtained on the sheep will hold good for the rat is extremely uncertain, if the venous pressure in the rat's umbilical cord and placenta does not rise as gestation proceeds, it will be seen that the blood pressure in the maternal arterial channels, which are related most closely to the venous

end of the foetal capillaries in the labyrinth, must also remain at the same level throughout the latter half of pregnancy. Since this pressure must approximate to that of the foetus, some means of reducing the maternal arterial pressure must obtain, probably by the increased capacity of the maternal "arteries" in the placenta.

Finally, some comment may be made on the relationship between the "placental sign" in the rat and that in the macaque monkey. The "placental sign" consists of the presence of blood in the vagina, which may or may not be visible as an external flow. In the rat it extends from the 13th to the 16th days of gestation (Long and Evans, 1920) whereas in the macaque, it appears about the 17th day, and lasts for three weeks (Hartman, 1929). In the rat, the source of the blood of the "placental sign " is associated with the disintegration of the decidua capsularis and distal wall of the yolk-sac (Stafford, 1930); whereas in the monkey, Wislocki and Hartman (1929) have demonstrated in a 20-day pregnancy that the blood arises from the uterine glands, which are then engorged and greatly distended with blood. It will be quite obvious from this that the processes whereby the blood of the "placental sign" arises in the two animals are quite unrelated, both with regard to time of the bleeding in the gestation period and its source in relation to the embryo. In the rat, at any rate, it is a phenomenon more or less incidental to a very specialized degenerative process peculiar to rodents.

A search has been made for any process in the rat which, though it does not give rise to blood in the vagina, might in fact be comparable to the mechanism of the "placental sign" in the monkey. Such a phenomenon might be present on the 8th day of gestation, when the whole of the implantation pit is full of apparently fresh blood. This has extended out into the

narrowed uterine lumen. Some of this blood is no doubt derived from the superficial sinusoids of the subepithelial plexus which have ruptured around the embryo; most of it seems to be concentrated in the part of the implantation pit away from the embryo. and to come from a more remote part of the plexus. Moreover, Krehbiel (1037) described an extravasation of blood on the 8th day, occurring in that elongated part of the pit between the embryo and the uterine lumen; this lifted the epithelium from its basement membrane and so initiated its degeneration. This phenomenon of passage of blood into the cavity of the uterus in a place a little removed from the direct action of the trophoblast may bear some correspondence to the "placental sign " of the macaque, but does not reach the vagina, because its passage down the uterus is hindered at the level of each implantation site by the extreme attenuation of the lumen there. The few glands which remain visible on the 8th day show no significant quantities of blood. None communicate with the implantation pit, where as in the macaque they are prominently distended by large volumes of blood and open into the uterine lumen. There is little resemblance between the bleeding in the macaque at such an early stage and the late "placental sign" of Long and Evans in the rat. The two phenomena are not analogous, whether the bleeding results from trophoblastic action or hormonal control. The 8th day extravasation into the implantation pit in the rat is more analogous to the early phenomenon in the monkey and also to that in the uterine glands of many early human implantations.

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## THE VAGINAL BACTERIAL FLORA AND OVARIAN DYSFUNCTION

BY

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## Introduction.

THE important observation that a direct association exists between ovarian activity and the deposition of glycogen in the cells of the vaginal wall was made by Miura (1928). Other workers too, notably Cruickshank and Sharman (1934), and Rakoff, Feo, and Goldstein (1944), have confirmed this, so that it is now generally agreed that the biological conditions in the sexually mature vagina are governed by oestrogens which bring about the proliferation of the vaginal cells containing abundant glycogen. At the cyclical shedding of these cells and their autolysis the glycogen is liberated. If the vaginal bacillus described by Döderlein is present, it undoubtedly breaks down the available glycogen with acid production, for it has now been shown by several workers, notably Cruickshank (1934), that this bacillus breaks down glycogen "in vitro". Cruickshank has also suggested that it is probable that glycogen is also broken down in the absence of the vaginal bacillus through the agency of a diastatic ferment derived possibly from the vaginal cells. A mechanism like this would result in breakdown products of glycogen being available to other organisms, and thus acid could result from the breakdown of glycogen with or without the aid of the vaginal bacillus, but in whichever way the acidity is produced, it is directly proportional to the glycogen

content, and, as the vaginal bacterial flora is largely determined by the degree of acidity in that canal, it can also be taken as dependent on ovarian activity. In the mature vagina, therefore, in a subject with normal ovarian function, the bacterial flora is composed of acidophilic and aciduric organisms determined by the acid reaction in the vagina. These two features fit into the usually accepted Grade I of "vaginal cleanliness".

In the investigation to be described the material was collected from a group of 39 married women attending the Fertility Clinic at the Birmingham and Midland Hospital for Women. The examinations made numbered 52, and these were made as far as possible at different times in the menstrual cycles of the individuals. The sole complaint of the majority was infertility. They had been referred from the Gynaecological Out-patient Department because they were free from organic pelvic disease; nearly all of them gave a history of menstrual cycles which were within the normal limits, and, in each case, sterility in the husband had been excluded. Actually the group was originally chosen as one likely to show normal bacterial flora; but as the work proceeded, it was found that many of the subjects gave abnormal findings, and later it appeared probable that many of them were individuals with some degree of ovarian dysfunction.

## TECHNIQUE OF EXAMINATION.

In each case material was collected from the vagina with the patient in the lithotomy position, and with the aid of a Sims's speculum. The vagina was thoroughly swabbed. To find the pH a vaginal washing was done with doubly distilled water of pH 7.0, using a syringe with a long metal nozzle (intrauterine syringe). As far as possible the washing was restricted to the posterior vaginal wall so as to avoid any admixture of alkaline cervical mucus. The readings were taken with a new "British Drug Houses "capillator.

Approximately 60 per cent of the examinations were made at the premenstrual phase of the menstrual cycle, and the remaining 40 per cent during the pre-ovulation period. In each case material was examined in hanging drop preparations, particularly for the presence of Trichomonas vaginalis (Donné) and this parasite was found in one case. Two direct smears were also made, one of which was stained by Gram's method and the other by Ziehl-Neelsen's method for acid-alcohol-fast bacilli. Acid-fast bacilli were found in one case, and were identified as Bacillus smegma.

## OBSERVATIONS.

Hydrogen Ion Concentration.

The pH values were distinctly less acid than the accepted normal in the majority of cases. The premenstrual examinations gave pH values of 4.4 to 7.8 with an average of 6.5. Those taken during the oestral period, however, showed similar figures, the range of values being from 5.7 to 7.7 with an average of 6.4. The figures for individual cases are recorded in the accompanying table.

#### Direct Smears.

The number of leucocytes present are recorded in Table I by signs as follows:

Case	distribution

None	<del>,-</del>	9
Occasional	- <u>+</u>	13
Few	+	, 18
Moderate number	++	9 .
Numerous	+++	3

There was no absolute correlation between the number of leucocytes, or pus cells, as the case may be, with the pH values as suggested in the much quoted three grades of "vaginal cleanliness"; and the number of squamous epithelial cells was also very variable.

One column in the table records the presence of vibrio-like organisms in smear preparations. No vibrios, however, were obtained by special cultural methods suited to the isolation of vibrios, and, in fact, arguments, which suggest that gram-negative curved forms of diphtheroid bacilli may simulate vibrios in vaginal smears, have been put forward by the author elseelsewhere.\*

## Cultural Findings.

The main bacteriological findings are set out in the table, and the degree of bacterial population, as computed by the number of organisms seen in the direct smears, together with the amount of growth obtained in cultures, is indicated by plus signs.

In addition the following organisms were obtained: I beta haemolytic streptococcus which gave a negative soluble haemolysin test, I obligate anaerobic streptococcus, I obligate anaerobic bacillus of the Bacteroides fragilis type and, from 10 cases, Diplococcus crassus, a commensal gramnegative coccus, the importance of which has been reported elsewhere.\*

All strains of staphylococci were tested

<sup>\*</sup> To be published in the Journal of Hygiene.

Table I.

Showing the Findings in 52 Examinations of 39 Cases.

	T	<u> </u>	T		ī	1	1		
CASE	MENSTRUAL	Hd	LEUCOCYTES	VAGINAL BACILLI	DIPHTHEROID BACILLI	STAPHYLOCOCCI	" VIBRIOS " (SMEARS)	ENTEROCOCCI	COLIFORM
1	Pre.		+	_	++	+		+	
2	Pre.	4.4	_	++	_	_	_		_
3	Pre.	5.6	土	+++		+	_	_	_
3	18th	5.8		+++	_	+			
4	Pre.	5.8	_	_	++	+	++		+
4	15th	6.9	土	土	++	+	+++		+
.5	Pre.	6.8	_	+	+	+	_		_
6	Pre.	6.9	_	_	+++	+	_		
7	Pre.	5.6	+	_	+	+	+++		
7	Pre.	6.6	+	_	++	+	+++		++
8	18th	7.0	+	_	++	+			+
9	14th	6.8	++		+++	+			+
10	21st	4.4	++	+++					
11	14th	6.6	+		++	+	+++		+
12	1st Men.	7.0	±	+	+	+			+
13	Pre.	7.5	++		+	+	++		
13	Pre.	7.3	±		+	+	++		
13	7th	7.7	+		++	+	+++	+	_

Table I (Continued)

<del></del>		1	<del></del>			1	I		ı
CASE	MENSTRUAL CYCLE	Нq	LEUCOCYTES	VAGINAL BACILLI	DIPHTHEROID BACILLI	STAPHYLOCOCCI	" " VIBRIOS " (SMEARS)	ENTEROCOCCI	COLIFORM BACILLI
14	Pre.	6.9	++	-	++	+			+
15	Pre.	6.9	+	-	+	+	++	_	_
16	Pre.	7.7	+	+++	++	_	_	,—	<u> </u>
17	16th	7:3	+++		++	+	+++		_
17	Pre.		++		+++	+	-	+	_
18	Pre.	6.8	+++		++	+	+++		
19	Pre.	7.0	±		+++	+		+	_
19	12th	6.8	土	_	+++	+	+	+	_
19	Amen.	7.2	+.	+	+	+			— <b>.</b> .
20	Pre.	4.6	土	++	+	+	_	_	.+
21	Pre.	6.7	_	±	++	+	+++	+	·
22	Pre.	7.8	+		+++	+	_		
22	8th	6.8	+	_	+++	+	_	_	_
23	Pre.	7:3	++	+	+++	+	+		<u>.</u>
23	Pre.	6.6		+	+++	_	+	_	`
24	Pre.	6.0	+	+	+++	+	++	_	· —
24	14th	5.7	+	++	+	_	_	_	
25	Pre.	7.8	++	_	+++	+	_		+
-			<del></del>	·	<u> </u>	ı			

TABLE I (Continued)

	1	1	}	<del>,                                     </del>	<del></del>	<del>,</del>			
CASE	MENSTRUAL	Нq	LEUCOCYTES	VAGINAL BACILLI	DIPHTHEROID BACILLI	STAPHYLOCOCCI	" VIBRIOS " (SMEARS)	ENTEROCOCCI	COLIFORM BACILLI
26	Pre.	6.9	土	++	+	+			
27	Pre.	6.9	土	+++	+	+			
28	Pre.	7.0	士	++	++	+	_	+	1-
29	Pre.	4.6	+-	+++	_`	_			
30	21st	7.8	+	土	++	+		~	_
31	Pre.	7.7	++		+++			_	
32	Pre.	7.6	+	+++	+	+			_
33	10th	7.0	+++	土	+++				
33	17th	5.8	++	+	+++				
34	12th	6.6	±		+++	+			
34	`7th	6.9		_		+			+
35	16th	6.8	+	+	++		+		
36	16th	7.0	+		++		+		+
37	Pre.	4.5		+++	_			<u>-</u>	
38	15th	6.9	土	_	++	+			
39	10th	5.7	+	++	- [	-		+ .	

for the production of plasma-coagulase with negative results.

#### COMMENT.

From the findings it is evident that 13 of the cases: Nos. 2, 3, 10, 16, 20, 24, 26, 27, 28, 29, 32, 37, and 39, will fit into Grade I of vaginal cleanliness, if one accepts as a criterion of Grade I an almost exclusive population of Döderlein's bacillus in the vagina independent of the pH value. The pH values of these cases, however, show a wide range of variation, from 4.4 to 7.7. According to the generally accepted standards of a Grade I classification, only Nos. 2, 10, 20, 29, and 37, in which cases the pH values vary from 4.4 to 4.6, are eligible for inclusion in Grade 1. All the others have a pH value of over 5.7. The number of leucocytes in this group varies from ++ to none.

Taking the absence of the vaginal bacillus, and the presence of other organisms such as coliform bacilli, enterococci, diphtheroid bacilli, and "vibrios" as criteria of a Grade 3 classification, 19 cases could be included in this grade, to wit, Nos. 1, 4, 6, 7, 8, 9, 11, 13, 14, 15, 17, 18, 19, 22, 25, 31, 34, 36, and 38. In these cases the range of pH values is from 5.6 to 7.8. The number of leucocytes in this group varies from +++ to none.

Seven cases remain, namely, Nos. 5, 12, 21, 23, 30, 33, and 35. These show only a small content of vaginal bacilli in a mixed flora associated with a pH range of 5.8 to 7.8, but this range is almost identical with that of the last-mentioned group. In fact, if considered on the pH range alone without reference to the presence or absence of the vaginal bacillus, these 7 cases could be allotted to Grade 3. The leucocytes in this group vary from +++ to none.

It is evident that in these findings there is no absolute correlation between the bacterial flora and the two accessory grad-

ing factors, namely the pH and the number of leucocytes, but that there is some overlapping. Considered on the pH values alone, 34 of the 39 cases could be allotted to Grade 3, and, with the fall of acidity, the bacterial flora shows a gradual transition from one composed mainly of the acidophilic vaginal bacillus to a mixed flora with few or no vaginal bacilli, but of organisms which are favoured by a less acid reaction.

The significance of the varying number of leucocytes is uncertain but, after a special study of vaginal diphtheroid bacilli, the author thinks that it is possible thatsome may act as low grade irritants under certain conditions.

Although the actual number of infertile women studied is relatively small, there appears to be ample evidence that, in the majority, the reaction of the vagina and the bacterial flora are abnormal by comparison with the accepted normal standards for sexually mature women. The author suggests that the deposition of vaginal glycogen is deranged and that the findings are indicative of ovarian dysfunction.

## SUMMARY.

An examination of a group of 39 women attending a fertility clinic has shown that the majority possessed abnormal vaginal pH values, and therefore showed a tendency to acquire abnormal bacterial flora. It is suggested on a priori grounds that these findings are indicative of ovarian dysfunction.

I wish to express thanks to Miss D. M. Shotton for access to clinical material.

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# EXTERNAL VERSION UNDER ANAESTHESIA

BY

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In cases in which a breech presentation is discovered during pregnancy all the standard British textbooks of midwifery advise that prophylactic external version should be attempted, and most of these textbooks also recommend that in the cases in which version fails a further attempt should be made under anaesthesia. In spite of the almost unanimous advice of these teachers the authors were surprised to discover that in many hospitals external version under anaesthesia is not attempted, on the ground that it is highly dangerous to the foetus; and further, that it is considered impossible to perform version if the legs of the foetus are extended. When we referred to the literature we found that there were surprisingly few recorded series of cases of external version under anaesthesia. In fact, apart from cases listed without details in the clinical reports of various hospitals, the only series with more than 10 cases of version under anaesthesia are those of White and Flew (1933) with 92 cases, Wrigley (1934) with 76 cases, and Newell (1941) with 48 cases. Many authors recommend external version "with an anaesthetic if necessary", or in "exceptional cases", but do not specify the number of cases anaesthetized, and imply or state that they are few. In most of the reported series no distinction was made between primigravidae and multigravidae, and in none could we find any separation

of cases with flexed or extended foetal legs. We therefore thought it might be of value to review our own cases, with the particular object of discovering the value or danger of external version under anaesthesia, and especially in cases in which the foetal legs were extended.

We have included all cases in which external version was attempted under anaesthesia, and in whom the result at delivery was known. During the war years external version was performed or attempted on a number of patients who were subsequently delivered in other hospitals and, though we have written to each patient, we have been unable to secure information of the result at delivery in some of these cases. Although the foetal heart was audible after version in all these, we have excluded them, as relevant stillbirths and recurrent breech presentations might otherwise have been omitted from our results (see Table I). Comparison of the cases in this table with those in later tables shows that the proportion of primigravidae and the proportion of successful versions was somewhat higher than for the series as a whole, so that this exclusion does not favourably bias our results.

We wish to emphasize that in all cases one or more unsuccessful attempts at version without anaesthesia had been made before an anaesthetic was given, and the cases we are reporting, therefore, represent

TABLE I.

Cases excluded because the result at delivery was unknown.

(In all cases the foetal heart remained audible for as long as the patients remained under observation.)

•			No. of cases
Primigravidae:			
Version successful	•••		34
Version successful, breecl	n recurred,	,	
success repeated	•••		I
Version failed, success at	second		
attempt	•••		I
Version failed, one attem	pt		3
Version failed, two attemp			I
, 022102 -2232, 0110 2003-201		•••	_
			40
			<del></del>
Multigravidae:			
Version successful	• •••	•••	4

the more difficult cases. This is borne out by the observations that in 206 cases in which version was successful the breech presentation recurred in only 5, and that in 30 cases in which version failed subsequent spontaneous cephalic version occurred in only I case.

Technique of version. There has been nothing unusual in the technique of version that we have employed. As a routine we attempt version under anaesthesia between the 34th and 37th weeks in all cases in which version has failed without an anaesthetic. In cases in which a breech presentation is diagnosed at a later stage and version fails without an anaesthetic. we do not hesitate to attempt version under anaesthesia, and in 12 cases (6 in primigravidae) version was successful even at term. Apart from cases of twin pregnancy, and cases in which Caesarean section was proposed for some other reason, version has been attempted in nearly all cases diagnosed. In cases of doubtful disproportion version has sometimes been performed so that the relative size of the head and brim could be estimated.

The choice and depth of the anaesthetic is of the first importance, and the success of the operation greatly depends upon it. Unless really deep anaesthesia is used there is no advantage, and sometimes a positive disadvantage, in giving an anaesthetic. We have on different occasions tried a variety of anaesthetic agents, but for the great majority of cases have used gas, oxygen and ether, usually preceded by a full dose of morphia. The anaesthetic must be pushed to the level of deep surgical anaesthesia, when the abdominal wall is completely relaxed, and if morphia and ether are used we believe that the uterus is also relaxed. Chloroform is equally effective, but we have not used it on account of its greater danger. Other agents have proved ineffective in securing full relaxation with safety. We have lately tried curare, and though complete relaxation of the abdominal wall is obtained, we consider that the uterine tone is increased with this drug, and do not recommend it. There have been no accidents or significant complications due to the anaesthetics used in these cases.

As a routine, morphia (gr.  $\frac{1}{3}$  or  $\frac{1}{4}$ ) and atropine are given I hour beforehand, at which time the patient is placed in the Trendelenburg position. After ensuring that the bladder is empty, deep anaesthesia is induced. The breech is first disengaged from the pelvis. In a very few exceptional cases we have applied pressure through the posterior vaginal fornix to achieve this, but if the breech cannot be disengaged by abdominal manipulation it is doubtful wisdom to persist with attempts at vaginal pressure. The head is then pushed in the direction of flexion, that is the direction in which the foetus faces. This can be most difficult if the head is tucked under the costal margin, and it is

sometimes best to push the head to one side and somewhat down before pushing the breech up. If version is difficult in the usual direction of flexion it is attempted in the opposite direction, and this is often the most profitable direction if the foetal legs are extended, as the movement of the foetus may flex the legs and thereby make the version easier. There is undeniably a certain knack in version, and practice begets success. Frenzied violence or jerky movements are never employed, though considerable pressure with the fingers can safely be used. Immediately after version the foetal head may remain high, due to extension of the head, or in some cases to persistent extension of the Quite often, however, the head legs. sinks down into the pelvis with surprising ease and rapidity. In cases in which the head remains high an attempt is made to assess the fit of the foetal head to the brim, but often this is not possible until a day or two later, when the foetus has settled into its new position. There is, therefore, no need to be concerned over a high head immediately following version. A binder and lateral pads are usually applied for so long as the patient remains in bed, commonly the day following.

Results. The following tables set out our results. It will be seen from Table II that in primigravidae, version was ultimately successful in 149 out of 172 patients (87 per cent), in whom 152 out of 185 attempts at version were successful (82 per cent). In multigravidae version was ultimately successful in 57 out of 64 patients (89 per cent), in whom 59 out of 68 attempts at version were successful (87 per cent).

If the only cases considered are those in which the foetal legs were proven to be extended by X-rays or at delivery, then the following results are obtained (Table III). In primigravidae, version was ultimately

successful in 65 out of 82 cases (79 per cent), and in these cases 65 out of 91 attempts at version were successful (71 per cent). In multigravidae, version was ultimately successful in 23 out of 30 cases (77 per cent), and in these cases 24 out of 33 attempts at version were successful (73 per cent). It is probable that the legs were in fact extended in the majority of the other cases, bearing in mind the fact that previous version without anaesthesia had been unsuccessful. During the years 1946 and 1947 every such patient was X-rayed as a routine, and in 82 per cent of the total requiring version under anaesthesia the legs were shown to be extended, and there is no reason to suppose that the incidence was different in the other vears.

Foetal mortality. The methods of ultimate delivery of these women are set out in Table II, together with all cases of foetal death. From the table it will be seen that among 172 cases of version under anaesthesia in primigravidae 10 foetal deaths occurred. However, 6 of these were clearly unrelated to the version: gross congenital anomalies in 3 cases, tentorial tears in the subsequent labour in 2 cases, and I case in which the foetal heart was audible for 6 weeks after version and during 48 hours of a long first stage of labour. Among 64 cases of version under anaesthesia in multigravidae 4 foetal deaths occurred, but none of these were attributable to the version, being due to haemolytic disease in 1 case, tentorial tear in subsequent labour in I case asphyxia during breech delivery in 1 case, and in the fourth case the foetal heart was heard for several weeks after version, and no abnormality of the placenta or cord was found at birth. Among these 236 cases of version under anaesthesia 2 foetal deaths were certainly due to version; a case of prolapse of the cord, and a case of difficult labour due to a compound presen-

## TABLE II.

# Cases of External Version under Anaesthesia in which the result at delivery is known.

PRIMIGRAVIDAE. 172 cases (185 attempts at version).

Result of version		Method of delivery these cases	of	Foetal deaths	Foetal deaths attributed to version
Successful, but breech recurred. Success repeated	140	Normal delivery	114	2 spina bifida 1 osteogenesis imperfecta 1 prolapsed cord	ı prolapsed cord
Failed, but success at second attempt  Total	6	Forceps delivery	26	r tentorial tear r foetal heart heard until labour 6 weeks later. Died after long first stage.	
	•	Caesarean section (d portion 4, placent praevia 1)	ispro- a 8		
		Internal version and breech extraction for compound presentation	n	r compound presentation	r compound presentation
		Normal delivery	1		
Failed, spontaneous version Failed, one attempt Failed, two attempts	1 18 4	Breech delivery	17	r tentorial tear r macerated r cause unknown	i macerated. i cause unknown
Total	23	Caesarean section	5		
Sum Total	172	Totals	172	10	4
	Μυ	LTIGRAVIDAE. 64 cases (	68 atte	mpts at version).	
Successful Successful, but breech recurred, success re- peated Failed, but success at second attempt	2	Normal delivery	55	I haemolytic disease I foetal heart heard until labour. No ab- normality of placenta or cord	
Total	 57	Caesarean section	2		
Failed, one attempt Failed, two attempts	6 1	Breech delivery	6	ı tentorial tear ı asphyxia during breech delivery	
Total -	7	Caesarean section	ı		
Sum Total	64	Totals	64	4	0

GRAND TOTALS: 236 cases (253 attempts at version).

4 foetal deaths attributed to version (1.7 per cent).

## TABLE III.

Cases of External Version under Anaesthesia in which the result at delivery is known, and the foetal legs were seen to be extended in an X-ray or at delivery.

PRIMIGRAVIDAE. 82 cases (91 attempts at version).

Result of version	•	Method of delivery these cases	of	Foetal deaths	Foetal deaths attributed to version
Successful Failed, but success at	бо	Normal delivery	47		
second attempt Total	5 65	Forceps delivery	14	r tentorial tear r foetal heart heard until labour 6 weeks later. Died after long first stage	
		Caesarean section	3	` .	
		Internal version and breech extraction for compound presentation	1	1 compound presentation	r compound presentation
Failed, spontaneous	, _	Normal delivery	1		
version Failed, one attempt	1 12	Breech delivery	12	ı tentorial tear	`
Failed, two attempts Total	<del>-4</del>	Caesarean section	4		
Sum Total	82	Totals	82	4	r ·

## MULTIGRAVIDAE. 30 cases (33 attempts at version).

Successful Successful, but breech recurred. Success repeated Failed, success at	21	Normal delivery	22	r haemolytic disease r foetal heart heard until labour. No ab- normality of placenta or cord
second attempt Total		Caesarean section	1	
Failed, one attempt Failed, two attempts	6 1	Breech delivery	6	r tentorial tear r asphyxia during breech delivery
Total	7	Caesarean section	I	
Sum Total	30	Totals	30	4 0

GRAND TOTAL: 112 cases (124 attempts at version).
1 foetal death attributed to version (0.9 per cent).

tation, feet and head. In 2 other cases the cause of death was uncertain but may have been due to the version. The foetal mortality due to external version under anaesthesia may, therefore, be stated as 4 in 236, or 1.7 per cent. If we consider only the cases in which the legs were proven to be extended (Table III) there was 1 foetal death, that due to a compound presentation, among 112 cases, so that the risk is not shown to be greater for these cases.

Complications. Among these 236 cases (253 attempts at version) premature onset of labour occurred in 7 cases, but without stillbirth or neonatal death. The cord prolapsed in 1 case, and the foetus was stillborn. In 1 case of compound presentation the foetus was stillborn, but in another case of prolapse of the arm the child was born alive. Vaginal bleeding was recorded in only 5 cases, but slight bleeding certainly occurred in a larger number of cases. There were no stillbirths among these cases of vaginal bleeding.

Success-rate at different weeks. Table IV sets out the success-rate when version was attempted at different weeks of pregnancy. When dates were uncertain, cases were omitted from this table.

## DISCUSSION.

Many who allow the value of external version without anaesthesia maintain that an anaesthetic increases the foetal risk. especially Wrigley (1934), who utterly condemns the use of an anaestetic, Gibberd (1927), White and Flew (1933), Danforth and Galloway (1938), Taussig (1931), Dieckmann (1946), and Mengert (1947). The risks mentioned are placental separation, sometimes with external bleeding, premature separation of the membranes, the premature onset of labour, prolapse of the cord, or the prolapse of a limb beside the presenting part. It is not denied that all these accidents may occasionally occur, but in the present series they have been infrequent, as stated above.

Although none of the reported series separate the cases with extended foetal legs, several authors state that version is either impossible or dangerous if the legs are extended. Siegel and McNally (1939) do not attempt version if an X-ray reveals an extended breech. Randall (1934) abandons version if the breech cannot easily be disengaged. Donovan (1932) states that it is usually impossible to turn

Table IV.

To show success rate of version under anaesthesia at various weeks of pregnancy.

			All cases		Cases with extended legs			
Primigravidae			Success	(per cent)	Failure	Success	(per cent)	Failure
32-33 weeks			12	100	O	6	100	O
34-35			58	86	9	22	73	8
36-37 ,,			47	75	16	24	59	17
38-39 ,,	•••	•••	22	73	8	6		5
40-42 ,,	•••	•••	7		I	3		0
Multigravidae								
34-35 weeks			17	89	2	8	80	2
36-37 ,,			25	93	2	13	87	2
38-39 ,,	•••		10	77	3	` 2		3
40-42		••	7		Ö	I		0

, í

TABLE V.

To show reported mortality of uncomplicated breech delivery.

Author	. Cases excluded	Total No. of cases	Primi- gravidae	Foetal mortality per cent	Multi- gravidae	Foetal mortality per cent
King and Gladden (1929)	Infants under 5 pounds, macerated infants, twins.	158	78	7.7	8	12.5
McGuinness (1928)	Complicated cases, premature and macerated infants, congenital abnormalities.	36	30	13.3	56	23.2
Irving and Goethals (1926)	Complicated cases, twins, premature and macerated infants, congenital abnormalities.	235	94	12.7	141	7.8
Gibberd (1931)	Complicated cases, twins, macerated infants.	509	48	29.0	161	OURI O. Li
Macafee and McClure (1937) Complicated cases.	Complicated cases.	246	100	10.0	146	
Roy (1936)	Complicated cases, twins, premature and macerated infants, congenital abnormalities.	155	7.7	10.3	. 28	OF C
Patton and Mussey (1940)	Premature and macerated infants, congenital abnormalities.	261	131		130	DBSTE
Taussig (1931)	Premature and macerated infants,	162	, 83	12.0	62	TRIC
Queen Charlotte's Hospital Reports (1939–45)	Complicated cases, twins, premature and macerated infants, congenital abnormalities.	145	26	13.4	48	
Totals		1657	738	11.3	919	%. %. %.
						2

a frank breech if the legs are closely together. Dearnley (1931) writes "if the legs are extended fully and there is also extension of the child's body it is wiser not to do version, as when this is performed with force under anaesthesia damage may be done, and there is also risk of bringing a hand or arm down by the side of the head, which will cause difficulty in labour." In America even more extreme views are frequently expressed. example Stein (1941) condemns external version altogether in cases of extended breech presentation as failure is stated to be common, and attempts at version may increase attitudes of deflexion. Another common American opinion is represented by Henderson (1941), who condemns external version, as he considers that a flexed breech is easy to deliver, while with an extended breech external version is dangerous and commonly fails.

Wrigley's paper (1934) deserves special mention, both because he has collected 76 cases of version under anaesthesia from hospital reports, and also because of his violent condemnation of the operation. Among these 76 cases he found 45 cases of

successful version, but among these IO stillbirths occurred (I3 per cent), which result he contrasts with a mortality of IO per cent for breech delivery. The causes of these stillbirths are not set out in detail and may not, in fact, have been due to the versions; in any case our results are very different, both as regards mortality and the success of version.

Obviously, external version under anaesthesia can be justified only if the risk of the operation, bearing in mind the successrate, is less than the risk of vaginal breech delivery. The foetal mortality in breech deliveries has been much studied, and many large series of breech deliveries have been published. It would appear to be a simple matter to compare and correlate these published figures, but unfortunately the different authors are inconsistent in their methods of recording their results. Some reports do not separate primigravidae and multigravidae; some do not distinguish cases in which there was some other obstetric complication such as placenta praevia or disproportion: and conversely some authors even regard extended legs as a complication.

TABLE VI.
Reported results of version without anaesthesia.

Author		All cases No. of cases Successful		nigravidae Successful	Multigravidae No. of cases Successful		No. of cases with anaesthesia
Gibberd (1927)	232	204		<del></del>			
Newell (1941) Trubkowitch and	775	709	234	191	541	518	9 48
Archangelsky (1944)	247	228					
Ryder (1943)	214	198					4
Donovan (1932)	91	80	47	38	44	42	<del></del>
Bartholomew (1927)	54	39	26	15	28	24	2
McGuinness (1928)	59	57	24	23	35	34	2 ,
Thornhill (1936)	58	49	23	18	35	31	2
Siegel and McNally (1939)	68	55	21	15	47	40	
Glassman (1932)	64	61	10	9	54	. <del>5</del> 2	
Totals	1862	1680	385	309	784	717	
Percentages		90		80	•	741 94	_

series include deaths due to prematurity, malformations, and deaths before labour. The following authors plainly state their criteria for "uncomplicated" breech delivery, and separate primigravidae and multigravidae, and it will be seen that there is more agreement between them than is usual in the larger series commonly quoted (Table V).

From these figures it may reasonably be assumed that the foetal mortality for mature uncomplicated breech delivery is about II per cent in primigravidae, and slightly less in multigravidae, and this is the figure with which the results of external version must be compared.

We have reported successful version under anaesthesia in 87 per cent of primigravidae, and in 89 per cent of multigravidae, but we repeat that in all these cases version had previously failed without an anaesthetic. These are the more difficult cases, and the "success-rate" must be much higher if all cases of antenatal version are included. Many authors have reported their results in version without anaesthesia (Table VI).

As regards the foetal mortality due to version without anaesthesia the following figures are available:

	Total No. of cases	No. of cases anaes- thetized	Foetal deaths
Siegel and McNally (1939)	68	0	ı
Thornhill (1936)	58	2	O
Bartholomew (1927)	54	9	0
Gibberd (1927)	232	9	2
McGuinness (1928)	<b>5</b> 9	2	1
Macafee and McClure (1937)	134	О	О
Ryder (1943) Trubkovitch and	214	O	О
Archangelsky (1944)	247	- 4	3
Newell (1941)		48	24
Total Percentage	1851		32 1.7

As regards cases in which an anaesthetic was given for version, very little data is

available. From Queen Charlotte's Hospital Reports (1938-45) the following figures can be derived: Primigravidae 197 cases, of which 144 were successful; multigravidae, 51 cases, of which 37 were successful. Newell (1941) reported only 18 successes in 48 cases, but it may be remarked that 36 of these cases were given pentothal, a most unsuitable anaesthetic. It is not possible to discover the foetal mortality from the published figures, except that Wrigley (1934) reported 10 stillbirths following version in 45 cases, but as already remarked he gives no details of the causes of these deaths, which may have been quite unconnected with the versions.

We consider that our results are fairly representative and could easily be equalled or bettered by others. If the foetal risk from version is 1.7 per cent, and the probability of success under anaesthesia over 85 per cent, even in cases in which version has previously failed without an anaesthetic, the operation is clearly justified. We can perhaps illustrate our opinion thus: if 1,000 cases are treated by version there will be about 17 foetal deaths due to the operation, and about 15 foetal deaths in cases in which version fails and breech delivery occurs. On the other hand, if all the cases were delivered as breech presentations, there would be about 100 foetal deaths due to breech delivery alone. We therefore urge the more general adoption of external version under deep anaesthesia in the cases in which version has otherwise failed, and maintain that the operation is not unduly dangerous, and that it is possible even in cases in which the foetal legs are extended.

#### SUMMARY.

The results of external version under anaesthesia in 236 cases of breech presentation in which version had previously failed without anaesthesia are reported. Version was successful in 206 of these cases, and the foetal mortality due to version under anaesthesia in these cases was 1.7 per cent. The results and technique are presented in detail.

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# CHILD-BEARING IN THE TUBERCULOUS GRAVIDAE

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## INTRODUCTION.

Many complex factors combine to render the investigation of the co-existing conditions of pregnancy and pulmonary tuberculosis a problem of considerable magnitude. Consequently, while its study to date has involved much labour and research, observations and conclusions are neither complete nor final.

So long as the basic principles of the entire cycle of pregnancy are imperfectly understood, and fundamental knowledge of the natural history of tuberculosis is lacking, finite assessment of this problem must be deferred.

The writers, in an attempt to clarify their own views on the correlation of child-bearing and pulmonary tuberculosis, carried out this present investigation, and the results of their personal observations on 150 consecutive tuberculous gravidae are recorded in this study.

## RESULTS OF INVESTIGATION.

During the period, January 1947 to March 1948 inclusive, 150 pregnant, tuberculous patients were delivered in the maternity unit, Robroyston Hospital, Glasgow.

No selection was made in the patients admitted: all were recommended for admission from tuberculosis dispensaries and antenatal clinics, and accordingly results obtained may be regarded as applying to all types of tuberculous lung lesions associated with pregnancy.

Deterioration observed, clinically and radiologically during pregnancy, labour, and for approximately 2 to 3 months following delivery, was attributed to the effects of childbearing on the lung condition. Classification of tuberculous lung lesions being variable, it was decided for practicable purposes, to group patients on admission according to the following scale of assessments:

(r) "Quiescent" cases, in which the general condition of the patient was good; toxaemia was absent; tubercle bacilli were not present in the sputum, and serial skiagrams showed no sign of pulmonary progression.

(2) "Arrested" cases, in which the disease had been quiescent over a continuous period of 2 years.

(3) "Recovered" cases, in which the state of quiescence continued uninterruptedly for 5 years.

(4) "Active" cases, discharging tubercle bacilli in the sputum during the preceding 3 months.

Reference to Table I illustrates this

grouping.

Of the total of 150 patients under review, 79 were primiparae, 71 multiparae, and

624

their ages varied from 19 to 38 years, with the exception of 2 who were over the age of 40.

TABLE I.

Type of disease	Number of cases
Quiescent	73
Arrested	13
$\operatorname{Recovered}$	6
Active	58
Total	150

Table II is an attempt to correlate age and parity distribution with the clinical status of the patient at the end of the period of observation. artificial pneumothorax induced, with section of adhesions in 7; one patient,  $3\frac{1}{2}$  months pregnant on admission, was the subject of a two-stage thoracoplasty operation.

One other patient was admitted with massive left-sided pleural effusion, for which paracentesis was necessary.

Tuberculosis ante-dated the pregnancy in 108 patients, in 11 of whom the operation of thoracoplasty had been carried out prior to admission, while in 10 others, artificial pneumothorax was maintained concurrently with the pregnancy. The remaining 87 patients gave a history of routine sanatorium treatment, with artificial pneumo-

TABLE II.

Age group (years)		Prin	niparae		Multiparae					
	Imp.	ISQ	Worse	Dead	Imp.	ISQ.	Worse	Dead	Total	
19-23	6	16	I	2	2	5	3	0	35	
24-28	5	25	4	3	4	17	4	3	65	
29-33	2	8	0	2	5	11	2	4	34	
34-38	o	4	0	I	I	7	o	Ì	14	
	0	O	0	0	I	I	0	0	2	
	<del>,</del>			***				Total	150	

The following facts are elicited from the above Table: 30, or approximately 20 per cent of the total retrogressed, 13 or 43 per cent being primiparae, 17 or 50 per cent multiparae.

Scrutiny of case records showed that in 42 instances, or 28 per cent of the total, the pulmonary condition was discovered for the first time during pregnancy, and of this group, 4 cases were quiescent, 38 were active. Of the latter, 17 with advanced chest conditions retrogressed. Two of these were diagnosed early in pregnancy, 12 late; in the remaining 3 patients, all of whom died, diagnosis was made for the first time in the puerperium.

Collapso-therapeutic measures in their many forms were applied with success to 20 other patients during gestation: 12 had

thorax in 53, and phrenic nerve interruption in 10. Four deaths were recorded in this group of patients.

With regard to the influence of the tuberculous lesion on the pregnancy, it was found that toxaemias were uncommon. High blood-pressure occurred in 3 cases, eclampsia in 1, and antepartum haemorrhage in 1.

Labours were little affected; their duration varied from 1 hour to 24 hours 15 minutes, with an average of 14 hours for the primiparae, and from one hour 20 minutes, to 26 hours 35 minutes, with an average of 9 hours for multiparae.

Dysphoea of moderate degree was noticed in 18 patients during the height of the second stage of labour, and of these 2 had received thoracoplasty operations and

8 artificial pneumothorax treatment, while the remaining 8 patients suffered from advanced pulmonary tuberculosis. With the exception of 2 instances in which the afterbirth was manually removed, the placenta was expelled complete and spontaneous within 15 to 30 minutes. No spontaneous abortions occurred in the patients under discussion.

Portpartum haemorrhage occurred in 3 patients, puerperal sepsis in 1.

Reference to Table III illustrates the type of delivery and number of patients who went to term.

TABLE III.

Delivery	Pr	imiparae	Multiparae	Total	
Spontaneous Spontaneous a	 and	44	58	102	
episiotomy		8	2	10	
Forceps Forceps and	•••	4	2	6	
episiotomy	•••	14	2	16	
•		<del></del>	Total	134	

Two multiparae, seen for the first time at the 6th month approximately, died undelivered; in both the lung lesion was advanced and bilateral, and in I, tuberculous meningitis complicated the condition.

No deaths occurred during labour.

Table IV shows the number of patients on whom therapeutic interruption of the pregnancy was performed; clinical status at the end of the observation period is noted.

One hundred and thirty-seven infants were born to 132 patients, 119 or 86.5 per cent being normal, full-term, with death occurring in 3 cases. In addition, 1 infant, also delivered at term but with multiple congenital deformities, died soon after birth. Fourteen deaths occurred in 17 premature infants born.

Included in the group of premature deliveries were 5 sets of twins.

## DISCUSSION.

Although some success has been met with, attempts made to solve the recurring problem of the tuberculous gravidae have been retarded by many adverse factors, not the least of which is the present-day regrettable ignorance of the basic pattern of the combined conditions. Recently, however, numerous careful and painstaking contributions have appeared, resulting in the revision of opinion on their reciprocal relationships.

Accordingly, in the management of the pregnant tuberculous patient, a principle of conservatism is now advocated, and this precept has been put into practice in the patients under review. Furthermore, in an endeavour by the local authorities, City of Glasgow, to bring the management of these patients under unified control, the effects of a conservative and unitarian approach to the problem have been observed. At this juncture, before undertaking discussion of

TABLE IV.

•										
Method of		Pr	imiparae				Multiparae		· To	Total
termination	Imp.	ISQ.	Worse	Dead	Total	Imp.	ISQ.	Worse	Dead	
Surgical induction	0	0	0	0	0	0	0	0	ī	I I
D. & C	o	o	o	0	O	O	o	o	1	_
Hysterotomy and sterilization	r	o	3	2	6	1	o	r	0	2
Hysterotomy with-						0	0	0	О	0
out sterilization	1	I	0	0	3	0	ī	0	O	_ I
Caesarean section	<u> </u>	0							2	5
Total	2	I	4	2	9	1	I			

the results, mention of their management must be made.

In February 1947 special provision was made in the maternity unit and associated antenatal and postnatal clinics, Robrovston Hospital, Glasgow, for the observation and treatment of expectant and nursing tuberculous mothers, all of whom, resident within the city, were eligible for admission. In order that contingencies of an obstetrical and medical nature might be investigated and treated simultaneously, the staff included a consultant obstetrician and a chest physician, while the responsibility for the infant after delivery and during the neonatal period devolved upon the paediatrician to the hospital. Breast feeding, except in certain selected cases, was forbidden.

In the patients under review prior consideration was given to the lung lesion, the pregnancy being regarded as secondary in significance. Where indicated, surgical procedures designed to secure partial and complete immobilization of the diseased lung were applied, not only during pregnancy however long its duration, but throughout the puerperium.

Decision to apply such measures was influenced by many factors, of which the following are noteworthy:

(1) Family history, (2) Previous sanatorium treatment, (3) Character and extent of the lung lesion, (4) Obstetrical history, past and present, with special reference to the reaction of the patient to her pregnancies.

Finally, consideration was given to factors common to both conditions, such as the age of the patient, socio-economic circumstances, and individual nutritional states.

Since surgical measures do not negative the need for rest, emphasis was laid on this important principle of tuberculosis therapeutics. Diet was supplemented by adequate amounts of calcium, iron and vitamins, in an attempt to bring about an optimum nutritional state, with its resulting high level of resistance.

When obstetrical problems were encountered they were dealt with in an orthodox manner. Where pregnancy was advanced less than 5 months, therapeutic interruption was performed if the case was one of. advanced pulmonary tuberculosis in which collapse therapy was contra-indicated. Later than this period pregnancy was allowed to proceed to term and, where possible, labour was shortened and dystocia avoided. Spinal anaesthesia was preferred to inhalent drugs. On discharge from hospital advice was given the mother regarding contraception, and she was advised to report, with her child, to the postnatal clinic in 3 months' time for further assessment.

Conditions such as pregnancy and pulmonary tuberculosis with their diverse symptomatology and course, singly and collectively, make difficult the compilation of statistics of results, and the fallacy of formulating definite opinions on evidence presented in this study is obvious.

Table I shows that 50 per cent and 30 per cent of the total number of patients were quiescent and active respectively; the remainder were arrested and recovered cases.

Morbidity and mortality rates reached their peak in the present series (Table II) in age groups 24 to 28 years, affecting 37 primiparae and 28 multiparae, 14 or 21 per cent of which group of 65 patients deteriorated. In this group, pulmonary progression was the same for both primiparous and multiparous patients.

By comparison the incidence in age group 20 to 33 years, was 12 for the primiparae as against 22 for the multiparae; 2 or 16 per cent of the former, 6 or 27 per cent of the latter, deteriorated.

It is noteworthy that out of a total of 30 patients who showed evidence of progression of disease, 13 or 43 per cent were primiparae, 17 or 50 per cent multiparae. The numbers who showed improvement were approximately the same, 13 or 16 per cent for primiparae, and 13 or 18 per cent for multiparous patients.

While these figures are statistically insignificant to justify final pronouncements on the precise influence of age and parity on the evolution of pulmonary tuberculosis, the impression was formed that, generally, primiparae fared better than multiparae, presumably because the health of the latter had become impaired by repeated pregnancies and domestic responsibilities, resulting in lowering of the powers of resistance to a dangerous level. It is interesting to note that while Jameson (1935) supports this view, Cohen (1946) disagrees.

Of 42 patients in whom demonstrable lung lesions were discovered for the first time during pregnancy, 12 were diagnosed late in its course, death occurring in 7 cases, while 3 patients diagnosed tuberculous in the puerperium all died. In these 10 patients collapse therapy was contraindicated on account of the nature and extent of the associated lung lesion. By contrast, 20 patients whose lesions were diagnosed early in pregnancy received this treatment, and it is significant that none revealed deterioration in the period under The obvious conclusion, observation. therefore, is that the later in pregnancy the diagnosis of tuberculosis is delayed the worse the prognosis.

Pregnant patients tolerate collapse therapy well, even thoracoplasty in certain selected cases (McIntyre, 1948), and pregnancy should not be regarded as a contraindication to active forms of treatment.

Of 108 patients, the pulmonary lesion ante-dated pregnancy and, in the majority of cases, routine sanatorium treatment had been received: of this number only 4 patients died during the period of observation. This low mortality rate must be attributed to the fact that patients with known tuberculosis who become pregnant, and, at an early stage are brought under the surveillance of chest physicians, receive prompt and appropriate medical treatment. Experience teaches such patients not only the personal dangers of the disease, but also the hazards of contact infection, and concern for their child's welfare, no less than their own, leads them to seek advice early in pregnancy.

Of 134 patients who went to term, 70 were primiparae, 64 multiparae. Spontaneous delivery occurred in 122 patients, with episiotomy in 10, of whom 8 were primiparae.

Forceps were applied in 22 patients, with episiotomy in 16, 14 of the latter group being primiparae.

Postpartum haemorrhage was recorded in 3 instances, which is a small proportion of the total, and more favourable than the figure of 13 per cent given by Matthews and Bryant (1930) as the average incidence among parturient tuberculous patients.

Puerperal sepsis occurred in only I case, the condition being complicated by phlegmasia alba dolens.

The effect of the pulmonary lesion on the infants was almost negligible, 86.5 per cent being normal at birth, and in good general condition at the time of discharge from hospital; this figure corresponds very closely with that given by Barnes and Barnes (1930).

Five sets of twins were delivered.

Premature labours occurred in 17 patients, or 12.4 per cent of the total, in contrast to 8 per cent, which is the figure given as an average for the hospital generally. Since 14 of these patients suffered from advanced disease, the inference was that premature labour bore

a direct relationship to the lung lesion. The remaining 3 patients were delivered of twins. It is possible that in this latter instance plural pregnancy was the contributing factor.

As one would expect, the mortality rate was high among the premature infants. Autopsies failed to reveal evidence of existing congenital tuberculosis.

Premature evacuation of the uterus was carried out in 14 patients, 9 of whom showed subsequent deterioration, 6 of these being primiparae, 3 multiparae. While ceding the point that pregnancy may have an adverse effect on tuberculous lung lesions, results obtained in this investigation tend to show that therapeutic interruption does not necessarily bring about an improvement in the phthisical condition.

In conclusion the writers are of the opinion that collapse therapy is the sheet anchor for gravidae with active tuberculosis.

To be efficacious this treatment must be instituted early, and routine radiological investigations for all pregnant women should be carried out as a prophylactic measure.

So long as the obstetrician remains unskilled in the technique of collapse therapy, and the physician unfamiliar with modern obstetrical practice, the writers would advocate unified control as outlined in this study.

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# CEREBRAL VENOUS THROMBOSIS IN PREGNANCY (A Report of Two Possible Cases)

 $\mathbf{B}\mathbf{Y}$ 

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THE problem of cerebral accidents in pregnancy and the puerperium has aroused periodic interest since Von Hösslin's (1904) monumental work on the subject. At first there was a tendency to make no distinction between hemiplegia and other manifestations of cerebral damage which occurred before delivery, and those occurring in the puerperium; but of recent years it has been realized that the aetiology is usually different in pregnancy and the puerperium, and the main focus of attention has been upon puerperal cerebral thrombophlebitis. This paper describes 2 cases of cerebral damage occurring in pregnancy, which may have been caused by cerebral venous thrombosis.

Cerebral haemorrhage has always been regarded as the prime aetiological factor in the production of antepartum hemiplegia and aphasia. Von Hösslin describes 12 cases of hemiplegia or aphasia occurring in pregnancy and attributes all of these to cerebral haemorrhage, though in the light of more recent work it is probable that this diagnosis does not explain all his cases. Duhot (1920), reviewing the literature to date, stated that Leclercq (1906) had been able to find only 46 cases of antenatal hemiplegia in his review of the literature, and mentions a further 2 cases of his own. He regarded cerebral haemorrhage, cerebral embolism, and subarachnoid haemorrhage as the 3 main causes in that order of frequency and considered that hemiplegia in pregnancy was not to be regarded as dif-

fering aetiologically from hemiplegia occurring at any other time, except in those cases related to toxaemia of pregnancy. Among other rare causes, he mentions cerebral oedema due to toxaemia, the effects of toxaemia on the cortical cells, cerebral anaemia following haemorrhage, syphilitic endarteritis, cerebral tumour and cerebral tuberculoma; he quotes 2 cases where no cause could be found, but he does not mention cerebral venous thrombosis as an Alpers and Palmer aetiological factor. (1929) also consider cerebral haemorrhage to be the most frequent cause, but they refer to 3 cases of cerebral venous thrombosis in pregnancy, I of which was associated with an old mastoiditis and responded to treatment of this condition; but in the remaining 2 cases, both of which died, no cause for the thrombosis could be found postmortem.

Sinclair (1902) analyzed 18 cases of "puerperal aphasia" 5 of which occurred during pregnancy. Of these 5 cases, 4 had a hemiplegia in addition to the aphasia, and 3 of these cases had similar symptoms in a subsequent pregnancy. He puts forward the hypothesis that the causative factor in such cases is most likely to be cerebral venous thrombosis. In favour of this idea he notes the increase in fibrin in the blood in the later months of pregnancy when most of these cases occur, the gradual onset of the symptoms, and the liability to recurrence of similar symptoms in a subsequent pregnancy, when vessels which have

been damaged in a previous pregnancy are more liable to be the site of a second thrombosis. Apart from the alterations in blood chemistry, Sinclair gives no suggestion as to why thrombosis should occur in the cerebral veins.

Batson's (1940) work has thrown much light on this. He demonstrated a connection between the pelvic veins and cerebral veins via the vertebral system of veins and showed that raised intra-abdominal pressure favoured the transmission of a radio-opaque substance from the pelvic to the cerebral veins by this route. It remains now to find a cause for the pelvic thrombosis.

Martin (1944) states that he has encountered 2 and possibly a 3rd case of cerebral venous thrombosis occurring in pregnancy. In each case the patient had a stillborn child which leads him to suggest that the thrombosis may possibly have occurred first in the placental site.

The 2 following cases, in which a tentative diagnosis of cerebral venous thrombosis was made, differ from Martin's, in that a live child was born in each instance.

#### CASE REPORTS.

Case 1. Mrs. R. K., aged 29, 3-gravida. First pregnancy 1940, said to be complicated by raised blood-pressure and "kidney trouble" from the 5th month onwards, and labour was induced prematurely on this account, with the birth of a living female child weighing 4 pounds. Second pregnancy 1943, normal throughout with spontaneous fulltime labour resulting in a living male child weighing 7½ pounds. Third pregnancy—last menstrual period on 10th September, 1945. First examined on 28th January, 1946, when she was estimated to be 26 weeks pregnant and no abnormality was found except that her blood-pressure was 156/90. The Wassermann reaction was negative. On 22nd February, 1946, the blood-pressure was 160/90. On the morning of 6th March, 1946, the patient's husband found her attempting to move a heavy dustbin. He remonstrated with her

and she complained of headache and went to bed. She felt strange and knew that something was wrong but could not tell what. She felt confused and frightened and her eyes would not focus properly. When she reached out her right arm felt strange as if she could not touch things properly. In the afternoon she appeared to have difficulty in expressing herself and in naming common articles and could not recall her. She was admitted to the children's names. maternity ward at Mile End Hospital that evening. On admission she was found to be about 34 weeks pregnant, vertex, left occipito-anterior, head not engaged, foetal heart heard, blood-pressure 150/88, urine nothing abnormal found, slight oedema of the ankles. She was quiet and pleasant, smiling when approached and co-operative in the physical examination. She was unable to give any account of herself or of her illness and could not answer simple questions. Sometimes she obeyed instructions correctly, at other times incorrectly. Conversation was limited. "I'm all right. nothing wrong with me. I find difficulty in my head. I can't think. I can't quite work it out." She appeared distressed but not agitated. Rough testing of motor and receptive speech functions suggested perseveration, recognition of common objects and their use, but inability to name them. Owing to her aphasia it was impossible to assess how far her orientation and her intellectual functions were impaired. The nervous system was otherwise normal.

As she presented a picture of a confusional state, and no evidence of any serious obstetric complication apart from her raised blood-pressure, she was transferred to the Maudsley Hospital on 7th March, 1946, for psychiatric investigation. The above findings were confirmed, detailed tests of speech function showed nominal aphasia, slight paraphasia, paragraphia and some disturbance of higher conceptual ability. Her recollection of the onset of her illness and of her stay in Mile End Hospital was patchy. X-ray of skull and electroencephalogram showed no abnormality, perimetry showed normal fields, erythrocyte sedimentation rate 58 mm. drop in 1 hour, cerebrospinal fluid normal, urine consistently showed a trace of albumen.

She made slow progress while in hospital, but when re-admitted to Mile End Hospital on 3rd May, 1946, she still had all the above symptoms present to some degree. She was mildly depressed by her inability to express herself. Physical examination showed the uterus to be at term, vertex, left occipito-anterior, head engaged, foetal heart heard, blood-pressure 144/92, urine nil, abnormal. On 19th May, 1946, she went into labour spontaneously and after 14½ hours was delivered of a living female child weighing 7 pounds 12 ounces. The placenta weighed 2 pounds 2 ounces, and showed numerous areas of infarction, but the nature of these "infarcts" is not stated. Her puerperium was normal and when discharged home on 28th May, 1946, it was reported that her mental state was much improved.

On 9th July, 1947, she attended the out-patient department at the Maudsley Hospital. She stated that she felt very well, her only disability being occasional difficulty in using unfamiliar words: "I know what the word is in my mind but I can't say it." She had a very clear recollection of her illness and remembered many small details of the questions she had been asked. She stated that she did not at first realize that there was anything wrong with her speech but remembers that when she went into hospital she had to answer by signs, and that she could not always understand what was said to her and this made her frightened and confused. Her comprehension and speech had returned gradually and were not complete until some months after the birth of her baby. Her memory appeared to be excellent, she occasionally seemed to have a little difficulty in grasping a question and there was some hesitation over, and mispronunciation of unusual words, e.g. "triang" for triangle and "circe" for circle, but she recognized and named objects correctly and could read and write correctly. She was estimated to have made a very good recovery.

CASE 2. Mrs. E. B., primigravida, aged 32. Last menstrual period 1st July, 1946. Expected date of delivery 8th April, 1947. Pregnancy was normal apart from a cough which necessitated her staying in bed for a few days when 7 months pregnant and which lasted 2 weeks. She also had two or three severe headaches at monthly intervals during the latter part of her pregnancy; these lasted for a whole day and on one occasion the headache was associated with vomiting. She attended the antenatal clinic regularly and no abnormality was

noted until 25th March, 1947, when her blood-pressure was found to be 145/90.

The patient gives the following account of her illness. On 25th March, 1947, at about 8 a.m., she had a sudden dead feeling just above her left ankle; there was no weakness and the sensation passed off in about 5 minutes. At about 11 a.m. on the same day, while sitting in the antenatal clinic, she had a feeling of weakness and numbness of her left side in the region of her waist so that she was unable to get up off the bench; this lasted 5 to 10 minutes and passed off. At 7 p.m. the numb feeling in the left leg recurred for a few minutes and then ceased.

On 26th March, 1947, she felt well on rising, but at 9 a.m. she suddenly felt weak and her left side went "dead and stiff". She was unable to move her left arm or leg but could move her right side. She tried to call out but her face felt stiff and she could make no noise. This lasted about half an hour and then wore off, the leg recovering first, then the arm and lastly the face. She telephoned and asked the doctor to call but he did not come that day. At 11 a.m. the attack was repeated, the only change being that her face felt less stiff and she was able to talk; this attack lasted about 20 minutes. There was a further attack at 1 p.m. and -from then on small, similar attacks lasting about 5 minutes occurred every 15 to 20 minutes; during these attacks the left side of her face and her left hand twitched. No further attacks occurred after going to sleep but she woke up once during the night with her teeth chattering and her husband had to hold her jaw still till the attack passed off.

On 27th March, 1947, she felt well on first rising but at 8.30 a.m. her left side suddenly became weak, although there were no sensory changes. This weakness persisted unchanged, she could still move and stand but there was a marked difference in power on the two sides. Her doctor visited her and told her that her blood-pressure was raised.

On the 28th March she felt much the same, but while knitting she suddenly lost the use of her left hand so that she dropped her knitting and could not pick it up again.

On 29th March she was admitted to the maternity ward at King's College Hospital. Her admission-notes record pupils equal, discs normal, left-sided hemiplegia, with gross spasticity of arm and increased reflexes, Hoffman's sign positive on

the left, ankle and patellar clonus on the left with left extensor plantar response, no sensory loss. Heart normal. Blood-pressure 150/90.

On 3rd April the patient went into labour spontaneously and after 3 hours had a normal delivery of a healthy male child. There followed a gradual, slight improvement in all the paralyzed muscles except those of the left hand. However, she became very depressed, refused to take any interest in her child and presented a picture of severe, reactive depression; it was felt that she was a suicidal risk and on 11th June she was transferred to the Maudsley Hospital for psychiatric treatment.

On admission she was found to have a left-sided hemiplegia. There was slight weakness of the left side of the face involving mainly the lower half. There was slight ptosis of the left eyelid but eye movements were full and the pupils were equal and reacted to light and on accommodation. The tongue deviated slightly to the left side. There was marked weakness of the left arm, the hand being almost useless, the limb was spastic and the tendon reflexes increased. The left leg was weak, but to a much slighter degree than the upper limb, it was spastic, the tendon reflexes increased, and the plantar response extensor. The abdominal reflexes were absent on the left side. There were Blood-pressure 130/80, no sensory changes. erythrocyte sedimentation rate 4 mm. in 60 minutes, Wassermann reaction negative. Blood count normal, haematocrit, prothrombin, and clotting times normal, icteric index 4, electroencephalogram normal, X-ray of skull and chest negative. She was apathetic and depressed, showing no interest in anything or any desire to get well. She was treated by psychotherapeutic interviews, and physiotherapy directed mainly to increase the use of her upper limb. Two months after admission she had 2 transient episodes in one day consisting of headache, blurring of vision of the left eye and tingling in both hands. These attacks each lasted 10 to 15 minutes and were not accompanied by any abnormal physical signs. When discharged home on 30th September she had almost complete recovery of her facial muscles. much improved power in the leg and improved power in the hand and arm, though fine movements of the hand were still very poor. Mentally she was much more cheerful and ready to help herself.

## DISCUSSION.

In both these cases the slow onset of the symptoms suggests a spreading venous thrombosis rather than a sudden cerebral haemorrhage or embolism. In Case 2 the recurrent paresis with Jacksonian attacks may well have been caused by a thrombus which at first only intermittently occluded the orifice of a tributary vein before the whole venous channel became blocked.

The possible diagnosis of disseminated sclerosis must also be considered. The complete and maintained recovery of the first case makes such a diagnosis unlikely. In the second case the development over a few days of a hemiplegia preceded by Jacksonian attacks, with no evidence of any other lesion in the central nervous system, is an unusual picture in disseminated sclerosis. We have now to consider the aetiology of the presumptive venous thromboses in these cases.

There are two factors operating in pregnancy which increase the liability to thrombosis. These are, first, the increased fibrin content of the blood which rises to 40 per cent above normal at term; and. secondly, the slowing of the maternal circulation through the placenta which, with the increased pressure on the iliac veins from the enlarging uterus, leads to stagnation of the blood in the pelvic veins and those of the lower limb. This stasis tends to promote clotting of the blood within the placenta formation of degenerative with the "infarcts" which serve to retard still more the maternal blood flow.

In Case I there had been a marked degree of hypertension for at least 5 weeks before her admission to hospital. In view of her previous obstetric history and the subsequent course of her pregnancy, it is probable that this was of the nature of a pre-eclamptic toxaemia. It is known that retroplacental haematomata, similar to

those found in accidental haemorrhage, but usually too small to cause symptoms, often occur in cases of pre-eclamptic toxaemia, and are thought to be due to a sudden relaxation of the maternal arteriolar spasm, with consequent flooding of the capillary bed and rupture of vessel walls. The fact that the patient's placenta was said to contain "infarcts" at term would favour the supposition that such haematomata had in fact occurred. Unfortunately, the term "infarcts" as used in common obstetric parlance is too vague to make this fact certain, as normal degenerative processes are often referred to as "infarcts". cerebral accident followed her attempt to lift a heavy dustbin by pressing it against her abdomen and pregnant uterus. It seems possible that this act caused a thrombus from one of the maternal placental veins to be shot off into the vertebral system of veins and thence to the cerebral veins.

The second case is less easy to explain. This woman had a slightly raised bloodpressure by strict obstetric standards, but no more than many women have in otherwise normal pregnancies. The only other abnormality in her pregnancy was the 2 or 3 attacks of severe headache which had occurred and which may have been due to a very limited degree of cerebral venous thrombosis. Her final thrombotic episode was not, however, accompanied by headache. In this patient the only explanation would appear to be to postulate some anatomical or physiological variation facilitating the passage of a thrombus from the uterus to a degree not present in most other women.

These cases show the importance of making an accurate diagnosis at an early stage of the illness. In Case 2, had the condition been recognized at its onset, it is possible that measures might have been instituted to prevent the spread of the thrombosis, with a much less severe development of the illness.

# SUMMARY.

The literature dealing with cerebral venous thrombosis in pregnancy is briefly reviewed.

Two cases of cerebral accidents occurring in pregnancy are described, and the factors which lead to the tentative diagnosis of cerebral venous thrombosis discussed. The impossibility of conclusive diagnosis is due to the fact that clinical recovery prevented postmortem confirmation.

My thanks are due to Dr. A. Meyer for much helpful advice and criticism in the preparation of this paper, and to the medical superintendent of Mile End Hospital, and the obstetric department of King's College Hospital, for access to the case records of these patients who were under their care.

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# SOME PRINCIPLES OF MYOMECTOMY

BY

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"SINCE cure without deformity or loss of function must ever be surgery's highest ideal, the general proposition that myomectomy is a greater surgical achievement than hysterectomy is incontestable." These are the words of Victor Bonnev which I choose for my text on this occasion.

Conservative surgical treatment uterine fibroids presents the enormous advantage, in the case of young women, of permitting the retention of the uterus and appendages and their consequent function.

The possibility of conservatism has engaged the attention of gynaecologists since the earliest days of operative gynaecology, and Tuffier in France, Alexander in England, and August Martin in Germany, pioneered in the field which was subsequently developed by Victor Bonney.

However, in spite of a wealth of experience together with progress in technique, the operation of myomectomy has nowhere really established itself, no doubt because of the erroneous belief that its mortality is higher than that of hysterectomy. X-rav irradiation, which destroys ovarian function, also is a competitor with the conservative operation because it has no comparable mortality in the postoperative stage.

The principal arguments against myomectomy have been based on-first, the

That there is a considerable mortality in difficult cases is not always apparent in most statistics, which thus appear more favourable than they are in reality. Therefore, for many gynaecologists, the indications for myomectomy are limited to subperitoneal pedunculated fibroids which offer little trouble and have no mortalityrisks. This is borne out by the figures which follow.

Whilst the defenders of myomectomy state that the frequency of its indications are in the ratio of 1:6 or even 1:3 in comparison with hysterectomy, its adversaries put forward the ratio of 1:14 or even 1:20 and suggest that only the desire for pregnancy in the case of young women should be considered as an absolute indication for the conservative operation. The danger of recurrence, which, however, does not surpass a figure of from 3 to II per cent, is not enough to outweigh the advantages of the conservative procedure and its importance to the female organism. We know to-day that, when in

fact that when several fibroid nodules are situated in the depths of the uterine wall, the cavities which result from their removal can become the sites of haematomas, exudates, abscesses—all susceptible to infection. Secondly, that bleeding during the operation and its repercussions in the postoperative stage constitute a further deleterious factor. The third factor is the presumed loss of biological value of the uterus after myomectomy.

<sup>\*</sup>Lecture given at the Chelsea Hospital for Women, London, on 12th June, 1948.

the course of surgical intervention there is no considerable loss of uterine tissue—and, as we will see later on, this can be realized in most cases—the biological value of the uterus remains complete.

Nor does the persistence of certain troubles, and in particular, meno-metror-rhagia, following the operation, constitute an argument against myomectomy, because these inconveniences were reported in old statistics when knowledge of endo-crinology was very limited and the therapeutic use of hormones almost unknown.

When meno-metrorrhagia persists after the operation it is due—and biopsies confirm this—to a glandularcystic hyperplasia of the endometrium easily treated by hormones and haemostatics. We also know that, where they exist, follicular cysts, which lead as much to amenorrhoea as to metrorrhagia, can be removed in the course of the operation.

Objections are also based on the probability that future gestation can be expected in about only 14 to 25 per cent Bonney, however, upholds the of cases. view that the function of the uterus remains intact, and furthermore, he has noted later pregnancies in some 38 per cent of cases amongst women from whom even multiple fibroids have been removed. Uterine inertia following delivery, abnormal adherence of the placenta, rupture of the uterus during pregnancy or labour, are rare phenomena which can be blamed, I believe, on the technique employed. Such objections do not, in my opinion, justify the ostracism of the conservative procedure , which continues to exist even to-day. They were weighty only in earlier times, when our knowledge of female biology was not as extensive and well-founded as it is to-day, and when surgical technique left something to be desired. But if one considers the aims of conservative surgery of the female genital tract, and the fact

that the gynaecologist should be an accomplished surgeon, the conclusion emerges that the reservations which I have enumerated earlier should be abandoned as limiting the field of indications and preventing extension and evolution of the technique.

We should, on the contrary, use all our efforts to minimize the dangers of myomectomy and to allow of its more widespread use, so that the genital system of the young female and, in a more general sense, maternity itself, may be more adequately protected.

My remarks are based on a progressive fall in the mortality-rates in my cases which I propose to report further on in this paper. Such results have allowed me to widen the indications for the operation and to use it systematically amongst all women under 45, independent of the consideration of later pregnancies. One can guarantee in this way the functional integrity of the genital organs or, at least, of the internal ovarian secretion, and this with no increase in the mortality-rate as compared with that of hysterectomy. I would add that the limit of age of 40, which I put forward earlier, I have now raised to 45, following the publication of Terada's statistics showing that in 50 per cent of women with fibroids menstruation continues until the age of 50 years.

Not the great size of a fibroid or the presence of multiple tumours—whose number may sometimes surpass 20—or their situation, or their aseptic trophic changes, or chronic inflammatory adhesions resulting from pressure or from torsion, do I regard as contra-indications to myomectomy. Nor am I concerned with bleeding if it exists at the time when surgical intervention has been decided on.

Temporizing, or any preoperative efforts at treatment (i.e. transfusion) sets up a vicious circle which is to the detriment of

the general state of the sufferer. On occasion I operate on almost exsanguinated women, since this is the only rational method of haemostasis.

It goes without saying that I avoid operating on those with grave cardiac lesions. But the less serious forms of heart trouble, functional murmurs and those reacting favourably to cardiotonic therapy, as well as diabetics controlled by insulin, are quite suitable cases; similarly the obese, in spite of the added difficulties of approach.

I would mention here that with large fibroids, for which one has to have recourse to X-ray irradiation in haemorrhagic cases, where for one reason or another operation is not possible, there is a danger of necrosis. Castration by X-rays brings in its train a diminution of the hyperaemia and nutrition of the tumour, without causing a disappearance of symptoms. that irradiation influences the volume of the fibroid almost only to the extent of inducing a castrational regression of the hyperaemia and oedema. that pain usually persists and sometimes bleeding, especially when a part of the fibroid is submucous. Further, reasons which cause us to reject hysterectomy in young women apply even more forcibly to the use of X-rays.

The problem becomes more complex when there is fever which can be due to several causes. If the cervix is open and there is a foul discharge, secondary endometritis can be expected since a submucous nodule diminishes the normal contractility of the uterus and favours the ascent of bacteria into the uterine cavity.

It is clear that in cases of this type, not only myomectomy but all surgical intervention must be postponed until the acute inflammatory process has disappeared. Where there is a submucous nodule it can be removed *per vaginam*. But the possibility of the co-existence of fibroids and pregnancy must not be forgotten, presenting, as it may, similar signs and symptoms and especially bleeding due either to the threat of abortion or to incomplete or missed abortion.

On the other hand, when the cervix is closed and one is satisfied that there is neither endometritis nor other inflammatory condition of the appendages or parametrium (which are absolute contraindications to intervention), the raised temperature, if any other systematic cause can be excluded, may be attributed to necrosis of the fibroid. The latter does not exclude operative interference since the process following compression or torsion is aseptic.

Here, I should like to draw attention to a point which I think of importance. It is that one should not operate in the presence of a raised erythrocyte sedimentation-rate. This sensitive control indicates, in a manner to which I personally attach an absolute value, that there is or is not, at the moment of operation, evidence of inflammation or acute infection.

I would add that before performing myomectomy, I never use lipiodography. Some workers regard this as an essential for the correct location of the uterine tumours. I think this is of no great importance since the operation is going to be done in any case. On the contrary, when the uterine cavity is shown to be irregular from the presence of fibroid nodules and if one of these to some extent closes the cervical canal, it is possible that the opaque fluid may be incompletely evacuated and thus unpleasant endo- or peri-uterine inflammatory reactions may follow.

I consider that the cervix should be carefully examined before every myomectomy and that, at times, biopsy be

done. One should not lose sight of the fact that cervical cancer together with fibroids of the uterus occur in about 2 per cent of cases, and it goes without saying that in such cases conservative treatment would be disastrous. I think it equally necessary to perform an endometrial biopsy in all cases with bleeding, about 10 days before operation, to avoid missing a co-existent cancer of the body of the uterus. This interval of 10 days is recommended to guarantee the absence of infection.

When first I began to examine, in a systematic manner, the results of myomectomies done by myself, the conclusions were far from encouraging.

When I say "in a systematic manner", I am not thinking of those relatively easy myomectomies, simple removal of a subperitoneal pedunculated fibroid, or even a small interstitial nodule, such as is commonly dealt with by every gynaecologist. I mean myomectomy in the sense of the excision of fibroid nodules, varying in number and in size, buried in the depths of the uterine muscle and even reaching to the endometrium.

Analysis of my first 100 cases, of which the mortality reached around 10 per cent—almost entirely due to peritonitis—faced me with a dilemma. I could understand the arguments put forward against this conservative operation by the majority of gynaecologists, but, instead of being discouraged, I persevered, believing that I must use my experience to arrive at better results.

As my experience grew, I tried to establish the key features of this operation by examining more than 400 cases; in the last 100 of which my mortality-rate was only I per cent.

It seems to me, therefore, that to-day it is worth while publishing the points of technique which led to these results, which I feel to be satisfactory.

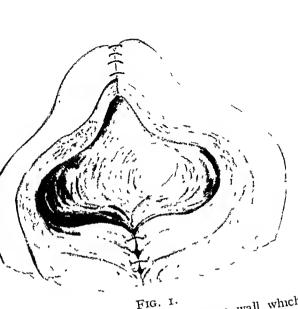
It is, in my opinion, a cardinal point that the uterine peritoneum be traumatized as little as possible, and that all the fibroids be removed by a single or, at most, two incisions.

These incisions should be made as high as possible and always transversely. Thus they can be prolonged under the perineum if there are disseminated nodules, either on the anterior or the posterior surface of the uterus, and also transverse incisions present the great advantage that the uterine wounds can be very easily covered, using the uterovesical fold of peritoneum. This is not possible when the incision is either vertical or on the posterior aspect of the uterus. If the attempt were made it would create abnormal anatomical situations of the uterus, necroses, urinary troubles, etc.

Every fibroid should be removed before beginning to suture the resulting cavities. If one closed cavities as they were created, the subsequent removal of other tumours would risk the separation of sutures already placed. Palpation will ascertain whether there remains any tumerous tissue worthy of removal. If any tiny nodules remain undetected it matters little, for which the slow rate of growth of such tumours, they will probably never develop to the point of requiring a second operation until the subject has reached or passed the age of 40 years, when the deprivation of her uterus and ovaries will not be a matter of very great concern to her and total hysterectomy may be done.

There is another reason why all the tumours should be removed before commencing to suture. The needle should not meet fibroid tissue, which does not lend itself well either to suture or to cicatrisation.

It may be said here that those who perform large numbers of myomectomies know that the fibroid degeneration of the



The protruding parts of the uterine wall which result after the removal of the fibroid must not be removed but joined together so that they can be inverted and fill the cavity.



The fibroid cavity has been filled with the inverted protruding parts of the uterine wall.

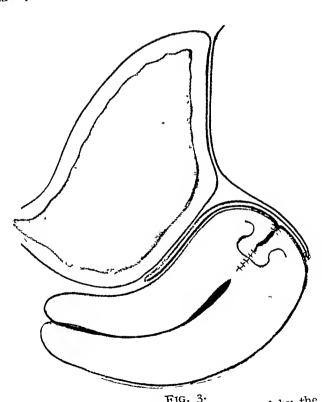


Fig. 3.

The uterine wound has been covered by the vesico-uterine fold, without opening it.

uterine muscle in toto is very rare. In such cases, of course, the conservative operation is not indicated. But the overwhelming majority of cases of this complaint are those of fibroid nodules of varying sizes separated from each other by healthy tissue.

A second cardinal point is that of haemostasis, which must be as complete as possible. However, in each cavity left after the removal of a fibroid one only ties bleeding vessels and generalized oozing is ignored, being controlled soon afterwards by the closing of the cavity itself in the way to be described later. It is enough at the time to fill the cavities with small towellings, but never with swabs, which may very well be lost or forgotten.

I, personally, never use the method of controlling bleeding by temporarily clamping the uterine vessels. I think that this leads to danger in that it does not permit local control and for perfect haemostasis one must identify and tie all bleeding points.

Having removed the tumours, one goes on to close the cavities by suturing in successive layers. When two cavities are in close juxtaposition, I do not remove the separating tissue but use it to line the combined cavity space. One should make every effort to avoid opening the endometrium—though this is not always possible—because this slight operative complication is reflected in the resultant statistics. I cannot follow, on this point, those who deliberately open the uterine cavity in order to remove nodules situated on its posterior aspect.

Suturing in successive layers is not, however, the whole story. The chief factor in closing such cavities lies in the use of uterine tissue itself, which is done by two continuous sutures. The first of these, which is not tightened, joins the superficial muscular layer with the edge of the wound.

The second, which is tightened, joins peritoneum to peritoneum and forces the adjacent and protruding lips of the cavity into its depths. I emphasize this point, which constitutes the main feature of my technique, and which I have not noted elsewhere (Figs. I and 2).

For greater security I finish off by some interrupted stitches which run no risk of giving way. But in order that the cavity may be well packed, both from within and without, it must be emphasized, as has been mentioned earlier, that the portion of the uterine wall which protrudes following the removal of the fibroids must not be removed but must be utilized for the above purpose. This manoeuvre has additional gain of retaining the whole biological value of the uterus, its shape, its volume and its function.

Finally, as an additional measure of security, one employs the peritoneum itself. Even triple suturing, or Bonnev's monk's hood, may not be sufficient under certain conditions. Should a haematoma form in the depths of the fibroid cavity and become infected, pus may infiltrate along the sutures and reach the peritoneal cavity. Therefore I use, as I have said above, the vesico-uterine fold (without opening it), not a difficult step, provided that the original incision on the uterus has been made transversely and not far behind the fundus of the uterus (Fig. 3). The suturing of the vesico-uterine fold on the posterior wall of the uterus is sometimes facilitated by Gilliam's operation.\*

Thus, all cavities resulting from the operation are completely closed, haemo-

<sup>\*</sup> This fixation of the uterovesical fold on the posterior aspect of the uterus does not affect the normal development of a later pregnancy. Indeed, and even independent of myomectomy, the fixation may prove to be, when the uterus is retroflexed, useful in maintaining an ideal position of the Fallopian tubes after the performance of Gilliam's operation for the cure of sterility. The uterovesical fold distends sufficiently in pregnancy.

stasis is perfect and the traumatized surfaces are extraperitoneal.

There are 2 points of importance in the postoperative phase:

- (I) The insertion and retention of an indwelling catheter. This should remain in place for 5 days to avoid the development of pressure by the full bladder on the uterovesical fold and subjacent sutures.
- (2) The administration of oestrogens, 50,000 units a day, for 5 days, for the purpose of sensitizing the uterus to the action of pituitary extract and of ergot. These drugs are essential to guarantee the contraction of the uterus and the cavities left by operation.

Elevation of temperature is generally due to the absorption of small haematomas and of the relatively numerous sutures, and this soon falls to normal. When infection is suspected penicillin should be exhibited. But the local use of antibiotics during the operation or prophylactic injections of penicillin are, in my opinion, unnecessary.

Examination sometimes discloses a general enlargement of the uterus which yields quickly to the abdominal application of ice bags. The uterus usually remains for a while somewhat larger than normal and at times there may appear a slight, evil-smelling vaginal secretion containing fragments of the sutures when these have been used on the endometrium. Ergot is clearly at work then.

About the third month following the operation, the uterus assumes its normal size. It retains all its functional value and I have many times learned that the removal of even 10 or 20 fibroid nodules has not prevented a later pregnancy developing normally and going on to a confinement carried out by the natural forces.

The tables show my statistics and empha-

size the fall in the mortality rate which has come about with experience.

# MYOMECTOMY RECORDS (PERIOD 1932-1948)

Total r					
20001	number	•••		•••	400
Mo	rtality	•••			17
Mo	rtality ra	te (per cent	t)		4.25
Mo	rbidity n	ate (per co	ent)		18.59
2,10	i bidity i	att (per ti	3111)	•••	10.59
Simple	Myomeo	ctomy			364
			- 48	•••	15
MO	гтанту га	te (per cer	it)	•••	4.12
Maroma	actomy	+ pregnan	Ctr		36
			-		•
	rtality			•••	2
1/10	rtanty ra	te (per cer	11)	•••	<i>5</i> ∙55
tef per	iod (1932	2-1042)			184
Mo	rtality	94-/	• • • • • • • • • • • • • • • • • • • •	•••	13
				•••	
1/10	rtanty ra	te (per cer	it)	•••	7.06
and ne	riod (roa	2-1948)			216
Mar.	etaliter	~ 1940)			4
M10.	rtality	4- (			1.85
W10	rtanty ra	te (per cent	c)	•••	1.03
Uterin	e cavity	орепед .			52
Mo	rtality	-F-W-			13
3/10	rtality	ta (nor con			9.61
MO	rtanty ra	ite (per cen	(t)		<b>3</b>
Literin	e cavity	not opene	d		312
	rtality				10
		ate (per cer			3.20
1410	itanty it	ite (per eei	,		-
					_
					Per
					cent
t		mortality ra	ate		10
_					4
2nd	"	"	•••		2
3rd	**	,,	•••	•••	
		,,	• • •	•••	
4th	"	• • •			
4th	,,	,,			•
•					No. of
Numb	er of Fil	broids			No. of
Numb	er of Fil	broids ise			-
Numb in	er of Fil each Ca Fibroid	broids ise 	•••		cases 181
Numb in	er of Fil each Ca Fibroid	broids ise 			cases 181
Numb in 1 2-5	er of File each Ca Fibroid Fibroids	broids ise 			cases 181 131
Numb in 1 2-5 5-10	er of File each Ca Fibroid Fibroids	broids use 			cases 181 131 20 11
Numb in 1 2-5 5-10 10-20	er of Files each Ca Fibroid Fibroids	broids .se 			cases 181 131
Numb in 1 2-5 5-10	er of Files each Ca Fibroid Fibroids	broids use 			Cases 181 20 11 12
Numb in 1 2-5 5-10 10-20	er of Files each Ca Fibroid Fibroids	broids use 			Cases 181 131 20 11 12
Numb in 1 2-5 5-10 10-20 20-39	er of File each Ca Fibroid Fibroids	broids ase   			Cases 181 20 11 12
Numb in 1 2-5 5-10 10-20 20-39	er of File each Ca Fibroid Fibroids	broids ase   			Cases 181 131 20 11 12
Numb in 1 2-5 5-10 10-20 20-39 Size of Small	each Ca Fibroid Fibroids """" """"	broids use   			Cases 181 20 11 20 12 12 12 12 12 142 180
Numb in 1 2-5 5-10 10-20 20-39 Size of Small Mediu	each Ca Fibroid Fibroids """ """ of Fibroid (walnut) m (orang	broids use ds e)			Cases 181 20 11 20 12 12 12 12 12 142 180
Numb in 1 2-5 5-10 10-20 20-39 Size of Small Mediu	each Ca Fibroid Fibroids ,, ,, of Fibroid (walnut) m (oran)	broids use ds e)		···	Cases 181 131 20 11 12 12 No. of cases 42

This improvement I attribute to following the principles described above and which have been established by experience. Therefore I wish to recommend them to others who will employ them, develop them and control them, and thus crystallize

a technique allowing a much wider use of an operation designed to conserve the female reproductive organs and their function to the end that they may enjoy, in the phrase of Victor Bonney "the fruits of conservatism".

# THE CARE OF THE EYES AT BIRTH

RV

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AND

R. M. Calman, M.B.,

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It has been felt by many workers that the use of silver nitrate as a prophylactic for ophthalmia neonatorum was due for review. These strongly caustic astringent drops may have a place in a practice where the commonest cause of infection is the gonococcus, but their use otherwise is open to question.

It has also been suggested that the silver nitrate itself has been responsible for some cases of "sticky eye", and that its use predisposes to infections. Some other agents which have been used are acriflavine in oil, mercurochrome (Marin-Amat, 1936), Protargol (Ballantyne, 1936), silver acetate, Sophol (Stein, 1917), and penicillin (Franklin, 1947).

This investigation was undertaken to decide if silver nitrate did, in practice, cause chemical irritation, if it prevented infection other than gonococcal, and to obtain some indication of the desirability or otherwise of continuing the use of Credé's method.

# Procedure.

As a preliminary, the normal flora of the baby's eye was investigated by cultures taken at just after birth, at 48 hours, and at a time some 7 to 10 days later. All babies had the eyes cleansed with a swab immediately after birth. These infants then received the standard prophylactic drop of

I per cent silver nitrate into each eye on transfer to the lying-in ward. The first culture was taken before these drops were administered. In the main investigation the male babies received silver nitrate, and the female babies no drops at all. Only babies born during the day had bacteriological examinations.

## BACTERIOLOGICAL METHOD.

Cultures were taken from the right and left conjunctival sac by drawing a sterile platinum loop along the lower fornix. This was then inoculated on blood agar and The plates were chocolate agar plates. incubated aerobically for 24 hours, and any growth was examined as a Gramstained film as well as morphologically. Staphylococcus aureus was only reported where the coagulase test was positive. All β-haemolytic streptococci isolated were grouped.

Cases of "sticky eyes" and conjunctivitis occurring in the hospital were also investigated. A "sticky eye" was diagnosed when a definite purulent discharge,

however slight, was present.

The laboratory procedure was similar in these cases, except that wool swabs were sent to the laboratory instead of plates being inoculated at the bedside. Films stained with Gram, and where necessary,

with Giemsa were examined in all these cases.

## RESULTS.

The organisms found did not in general present any unusual features. The gonococcus was not isolated in any case, but this was not unexpected, since only I case of gonorrhoea in the mothers occurred during the period. B. proteus was isolated from I case and its repeated isolation from a child with a rather chronic conjunctival irritation would suggest that it was the causal organism. All cases of infection with Ps. pyocyaneus occurred within a limited period, and some were associated with a discharging ear, from which the organism was also isolated. There were, during that time, adult patients from whom Ps. pyocyaneus was isolated.

In the cultures taken immediately after birth, it was striking that in very few instances were any organisms isolated. The cultures were taken before the babies were bathed. In all, 6 out of 340 showed growth on first culture, and none subsequently developed eye infections. We therefore feel confident that for practical purposes these babies' eyes could be regarded as sterile at birth. The organisms are shown in Table I.

The number of male and female children, and the numbers of babies from whom organisms were isolated in each group is

TABLE I.

Organisms in First Swabs.

Left: Diphtheroids Sterile Group B. haemolytic streptococci. Staph. aureus, albus, Group B. haemolytic tic streptococci and coliform bacilli.	Right: Coliform bacilli. Coliform bacilli. Group B. haemolytic streptococci. Staph. aureus.
Sterile.	Staph, aureus,
Sterile.	Staph. aureus.

shown in Table II. Many of these cases did not become clinically infected, although with a positive culture.

Table II.

Treated and Untreated Groups.

Male "treated" children—102,
of whom 18 showed growth on culture.
Female "untreated" children—118,
of whom 19 showed growth on culture.

Rate of infection:

Male 17.6 per cent. Female 15.4 per cent.

It will be noted that the infection-rates are very similar in the 2 groups.

The incidence of infection with different organisms, shown in Table III, was similar in both the clinical cases and the cases used in the experiment. The organisms isolated are similar to those found by Sorsby and his colleagues (Sorsby, Hoffa and Smellie, 1942; Sorsby and Hoffa, 1944), except that we had no cases of gonococcal ophthalmia.

TABLE III.

Pro	Preliminary investiga-		ofants	Clinically infected	
111	tions	Males	Females	eyes	
Staph. aureus	18	16	12	51	
Staph, albus	_	I	I	5	
Haemolytic				ŭ	
streptococcus	(B)1	_	4	I	
Strep. viridans	` ′_	2	<u> </u>	2	
Non-haemolytic	;				
streptococcus		_	_		
Ps. pyocyaneus		_	_	3	
Micrococci	2	_	4	2	
Coliform bacill	i	_	ī	2	
Diphtheroids	_	ī	3	~	
B. proteus		_	-	r	
	22	20*	25†	67	

<sup>\*</sup> Two cases of different organisms on different occasions.

Six cases of different organisms on different occasions.

Table IV.

Cases with more than one organism.

		nfected eyes
Staph. albus and diphtheroid		2
Staph. aureus and diphtheroid		4 ′
Non-haemolytic streptococcus and		
Staph. aureus		I
Staph. aureus and Staph. albus	•••	2
Staph. aureus and Ps. pyocyaneus		2 ,
Staph. aureus and coliform bacilli	•••	2
Staph albus, Staph. aureus, coliform		
bacilli and streptococci	•••	1

The figures in Table IV represent the number of children infected with each organism. An organism has only been counted once from any one case. Repeated isolations from the same case have not been counted. The clinically infected babies included most of the cases occurring in the hospital during the period of the investigations.

It is interesting to compare the frequent occurrence of *Staph*. aureus in our and Sorsby's cases with the paper of Thomas (1928) in which he reports as a rarity 100 cases of *Staph*. aureus infection in the neonatal period.

Our results do not follow those of Browning (1936), who obtained a high percentage of pneumococci. He also attributes purulent cases, in which organisms were not found, to irritation by silver nitrate. We do not consider, however, that examination of pus by methylene blue and Gram-stained films is adequate to prove the absence of organisms or inclusion bodies.

# TREATMENT.

Until penicillin was available sulphonamides, locally or systemically were used in the treatment of infected eyes. Local albucid drops have nowbeen given up. The administration of sulphamezathine or sulphathiazole orally for 2 to 4 days accom-

panied by local cleansing has been found effective in most cases.

Penicillin has also been used both locally and systemically. We have used it in accordance with the technique described by Sorsby (1945) and Sorsby and Hoffa (1945) one drop of solution of 2,500 units per ml. being instilled at frequent intervals for I to 2 hours. Sometimes this has had to be repeated on several days. This is an effective treatment, but requires one nurse's entire attention. Systemic penicillin, as now recommended by Sorsby (1947) either in 2 large doses daily, or in smaller, more frequent injections has been found more reliable and is less likely to involve handling of infective material. Frequently the discharge clears after the first injection.

It is probable, however, that oral penicillin in adequate amounts will supersede the above methods.

The treatment has always been started in advance of bacteriological diagnosis, and has been modified subsequently if necessary.

#### CONCLUSIONS.

There does not appear to be any great difference in the infection rate between "treated" and "untreated" eyes. No clinical evidence is found for an irritative conjunctivitis due to silver nitrate. In this we do not agree with the findings of Franklin (1947) who found that, of infected eyes, 3 times as many occurred in babies receiving silver nitrate as in those receiving penicillin drops.

Our results add support to the view that silver nitrate is not harmful in itself when carefully administered. The importance of fresh solutions, and strict adherence to the correct dosage have been frequently stressed.

On the whole, however, it does not appear that, in the type of case encountered in this hospital, the use of silver nitrate is

still necessary. The adequate treatment of gonorrhoea in the mother, and the availability of potent therapeutic agents for its treatment in the child have probably rendered the administration of any form of eye drops unnecessary.

Our thanks are due to Dr. J. Murray, Director of the Bernhard Baron Memorial Research Laboratories, for advice and encouragement; to the medical staff for permission to carry out the investigation; and to Mr. Goodwin for technical assistance.

One of us (M. D. T.) is receiving a grant from the Nuffield Foundation, and is working under the direction of Professor Alan Moncrieff, Director of the Institute of Child Health.

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# BREAST HYPERTROPHY AND PREGNANCY

BY

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During the last 5 years I have had the opportunity of operating on 6 patients suffering from excessive hypertrophy of the mammary glands. Because of the unusual symptoms that each of these cases presented, and the similarity of the pathological condition, I have been urged to write this paper.

Primarily I was concerned with the plastic reduction of the hypertrophy of the breasts of these patients, each of whom was suffering from either habitual abortion or sterility. The remarkable results, however, that followed surgical intervention brought me to the conclusion that there exists a connexion between breast hypertrophy and the course of pregnancy. I am quite aware that the material upon which I draw my conclusions is not sufficient, yet the consistency in all cases warrants attention and cannot be dismissed as pure coincidence.

Four of these patients were suffering from habitual abortion. All were between the ages of 25 and 35 years, of normal build and enjoying general good health. They were married to normal, healthy men and, although no pathological condition could be found, the patients presented a history of recurrent abortion between the 3rd and 4th month of pregnancy. All 4 patients had been under the constant supervision of a gynaecologist and had undergone all necessary precautionary treatment, particularly avoiding all mental and physical strain. In spite of this, uterine contractions and haemorrhage invariably occurred after

the 3rd month of pregnancy, resulting in complete abortion during a period of 2 to 3 weeks.

Three of these women were curetted before their last pregnancy to no avail. Two presented similar states of health and mental outlook and, although no pathological condition could be detected, they were sterile. Both had been married 5 years; one reported an occasional delay in her menstrual periods, followed by an excessive loss of blood, which pointed to a definite glandular disturbance if not to an early abortion.

The similarity in all cases was an excessive hypertrophy of the breasts, and the surprising results of surgical intervention were that each patient became pregnant after the plastic reduction of the mammary glands. Five completed normal pregnancy and were delivered of healthy children. The last, on whom the operation was performed 6 months ago, is now in the 4th month of pregnancy, and there are no signs of thrèatening abortion.

## CASE HISTORIES.

CASE 1, February, 1942. D. H., 29 years of age, married to a dentist. Family and personal history normal. The patient is the 4th child in a family of 6, the husband the 2nd child in a family of 3. The patient started menstruating at the age of 14. By the age of 18 she had already developed excessive breast hypertrophy, which was a cause of great embarrassment and suffering to her. Married at 22, reporting normal sexual life. First pregnancy occurred soon after marriage and progressed normally for 3 months. After the 3rd month

she gradually began to experience abdominal pain and slight loss of blood. Threatened abortion was diagnosed by the gynaecologist and, although all necessary precautions were taken, the patient miscarried ro days after the beginning of the symptoms. This was followed in the course of time by 3 more pregnancies, with the same results. I was called into consultation by the gynaecologist after the patient had received hormonal treatment without much benefit.

On examination, the patient presented excessive hypertrophy of both breasts, which were painless on palpation. Plastic reduction was decided upon. I removed three quarters of the glandular tissue in a one-stage operation. Post-operative treatment was normal and the patient was discharged from hospital 3 weeks later.

Four months after surgical intervention she became pregnant for the 5th time. She was kept under constant supervision by the gynaecologist, but no special precautions were taken. Pregnancy developed normally and she was delivered of a healthy boy, 8 pounds in weight. There were signs of lactation in the breasts, but the quantity of milk was not sufficient to warrant feeding the baby. The patient has since been delivered of a further child.

Case 2. September 1942. S. R., aged 31 years, married for 7 years to a healthy mechanic. Personal history of both husband and wife normal. Patient started menstruating at the age of 12, and stated that up to the age of 21 she had normal-sized breasts. Married at the age of 24. First pregnancy occurred 3 years after marriage, by which time she had put on flesh and her breasts had developed excessively. To avoid repetition I will only mention that the history is similar to Case 1. The patient became pregnant 3 times and aborted about the 3rd month for no apparent reason. She visited the gynaecologist at regular intervals but the results were always the same.

Plastic reduction, with the removal of two-thirds of the glandular tissue, was carried out. The breasts were left slightly larger than the previous case in order to conform to the general physique of the patient. She remained sterile for over a year after the operation, despite living a normal married life. The fourth pregnancy occurred exactly 15 months after the operation and progressed normally. She was delivered of a healthy

boy. The child was 9 pounds in weight and delivery was by forceps. In March, 1946, she was delivered normally of a baby girl.

CASE 3, June 1943. H. W., 27 years of age, married for 4 years; husband of poor physique, a bank clerk. Both husband and wife reported normal family histories. Wife became pregnant 2 months after marriage and progressed normally for 4 months. Onset of pain and haemorrhage was sudden and for no apparent reason. Complete abortion occurred in the course of 8 hours from beginning of symptoms. On 2 more occasions patient became pregnant, with abortion occurring during the 4th month. No pathological condition whatsoever could be found, with the exception of excessively large breasts which, the patient stated, had developed very quickly since puberty. Her menstrual periods had been slightly irregular. After the 3rd abortion the patient was curetted and 2 weeks later plastic reduction of the breasts was carried out. Three-fourths of the breast tissue was removed. The patient was seen again 3 months later and was found to be 2 months pregnant. Pregnancy terminated normally with the birth of a baby girl. She again became pregnant during the following years and was delivered of 3 normal children. After birth of the last child she was advised to use contraceptives on account of a weakened state of health.

CASE 4. January 1944. B. D., 34 years old, of slim build and narrow pelvis. Married for 10 years to a healthy professional soldier. Personal and family histories normal. For financial reasons the couple had avoided having children during the first 5 years of their married life. In the last 4 years the patient became pregnant 3 times and aborted each time during the 3rd month of pregnancy. No abnormality was found apart from the narrow pelvis, which was believed to be the cause of the abortions. The patient, however, had abnormally large breasts, which appeared almost grotesque in comparison with her slender frame.

Plastic reduction with removal of almost the entire gland was performed. She became pregnant a few months later and the pregnancy proceeded normally for 8 months; at this stage she became very uncomfortable with the pressure of the pregnant uterus on the internal organs—due to her small build. Caesarean section was deemed advis-

able and was performed 3 weeks before term. A small 5½ pounds baby girl was delivered. Post-operative recovery was normal. The patient was allowed to have another child which was delivered by Caesarean section and at the same time she was sterilized as it was considered that further pregnancies would endanger her health.

CASE 5. March 1944. S. C., aged 27 years, of normal build and health. Nothing of note in personal and family history. Began menstruating at the age of 15 and by the time she was 21 her breasts were abnormally large, which not only caused her much embarrassment but interfered with her favourite sport of swimming. She married at the age of 20 and, although enjoying normal marital life, no pregnancy occurred. Both husband and wife had been medically examined, but no cause could be found for the sterility and several courses of treatment had been prescribed and carried out without beneficial result. The absence of a child was threatening their happiness.

Plastic correction of the breasts was carried out primarily for aesthetic reasons, but the possibility that the intervention would help to cure the sterility was not overlooked. Six months after the operation the patient was examined and found to be, apparently, in the 4th month of pregnancy. Because of the somewhat abnormal appearance of her condition, she was kept under constant observation for the next few weeks. By this time slight haemorrhage had occurred and the size of the abdomen did not correspond with the age of the pregnancy. An X-ray examination demonstrated the presence of a hydatidiform mole. Evacuation of the uterus was performed by the abdominal route. For a year the patient adopted the use of contraceptives because of the state of her health, after which period she was allowed to become pregnant and was delivered of a normal boy.

Case 6. September 1947. P. G., aged 25 years, a very healthy well-built woman. Family and personal history of both husband and wife showed nothing abnormal. Patient began menstruating at the age of 12 and already at that time she had developed unusually large breasts. Married at 19, and had no pregnancies for the first 6 years. She reported that her menstrual periods had occasionally been delayed, sometimes for as long as 10 days, and were then followed by a heavy loss of

blood. These could be interpreted as early miscarriages.

Encouraged by the success of a previous case, plastic reduction of the breasts was recommended as a remedy for sterility. The mammary glands were reduced to one-fourth their size. Four months after the operation the patient became pregnant and in April 1948 she was found to be in the third month of pregnancy. She is being kept under regular observation and there is every reason to believe that the pregnancy will continue to term without complications.

#### - Conclusions

From the above cases I am convinced that there exists a connexion between breast hypertrophy, habitual abortion and sterility in women. The similarity of the six cases cannot be dismissed as pure coincidence. In all cases I have operated on 1 have applied a personally devised technique for breast reduction. This consists of removing the outer two-thirds of the glandular tissue, leaving the inner onethird which is supplied with blood by the internal mammary artery. At the same time the skin incision is placed in such a way as to leave only one small vertical scar below the nipple. This technique has the advantage of being adaptable for any degree of hypertrophy and allows the surgeon to execute the breast reduction in about 2 hours.

Although these cases may not be conclusive evidence, still they are sufficient to warrant further research into the causes of sterility and habitual abortion when no other pathological condition exists apart from the enormous size of the breasts. In these cases the operation not only cured the sterility and habitual abortion, but in reducing the breasts to normal size improved the general health of the patient and her physical appearance. The psychological benefit derived from the operation cannot be overlooked.

Naturally, one cannot emphasize too

strongly that not all women with oversized breasts would be sterile or subject to habitual abortion. There are hundreds of normal and fertile women who have overdeveloped mammary glands. It is only in cases of proven sterility and when all other treatments have failed to help the women to become pregnant that one may consider hypertrophy of the breast as the cause of sterility. The operation is suggested as a last resort.

These results also prove the error of the idea that plastic intervention of the mammary glands leads to subsequent inability to lactate, and also interferes with the normal mission of woman to bear children. On the contrary, the reduction of oversized breasts serves to encourage normal pregnancy and cures sterility. Moreover, the inability to lactate cannot be due to the operation as greatly hypertrophied mammary glands are, as a rule, physiologically incapable of function.

The most feasible explanation of the connexion between hypertrophy of the breasts and habitual abortion and sterility is the action of the mammary gland hormones upon the pregnant uterus. It would

seem obvious that an enormous breast produces an abnormal quantity of hormone, which by the 4th month reaches saturation, thus stimulating the fibres of the myometrium and causing them to contract. This hormonal saturation in the patient with normal breasts is reached only in the 9th month of pregnancy. The possibility also arises of the same phenomenon occurring in premature births. Finally, the hormonal action on the uterus can be either direct or indirect by means of other endocrine glands, particularly those that are involved in facilitating and maintaining a normal pregnancy.

From this short exposition one realizes that systematic research is needed in order to establish as certain the connexion between hypertrophy of the breast, abortion and sterility. It might be possible to isolate a specific hormone from the breast tissue which exists only in mammary hypertrophy and which is the cause of sterility. I sincerely hope that some better equipped research workers will take up this study and furnish the proof, which I believe exists, of connexion between the two conditions.

# A CASE OF ELEPHANTIASIS VULVAE

BY

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This case is considered to be worth recording because of the unusual aetiology of a tumour of the external genitalia which necessitated two deliveries by Caesarean section.

Elephantiasis vulvae is a term which one usually associates with tumours found in tropical countries and ascribed to filariasis due to Wuchereria bancrofti. In temperate climates, the disease is known as elephantiasis nostras and is usually the result of lymphatic stasis due either to chronic ulceration and fibrosis, or to the pressure of a neoplasm. The term elephantiasis, however, is often loosely given to any swelling of the vulva due to lymphatic or venous stasis, even though this may resolve as a result of treatment.

After studying the literature on this subject one concludes that true elephantiasis is not only an oedematous condition caused by lymphatic stasis, but that there is also a fibromatosis or hypertrophy of the underlying connective tissue. Lymphatic stasis itself, which may be due to varied causes, is an essential step in the development of the disease but, according to Witherspoon and McFetridge (1933), the hypertrophic changes in the underlying connective tissue do not occur until an infection of some sort has been superimposed.

În filariasis, elephantiasis is a clinical manifestation of the disease and is due

primarily to obstruction of the lymphatic channels. Anderson (quoted by Manson, 1946) is of the opinion that bacterial infection by staphylococci and streptococci is invariably associated with the disease, and it can well be imagined that the cutaneous ulcers commonly found on the surface of these swellings are readily available portals of infection. It has long been emphasized by authorities on tropical medicine that elephantiasis often results from repeated bacterial infection of the lymphatic system, which has already been damaged by the filarial worm. Repeated invasions by the filariae themselves are not essential, and dead or calcified filariae, acting as foreign bodies, may be enough to keep alive a chronic low-grade infection. Suarez (1933) declares that although filariae may be the cause of the lymphatic obstruction in many cases, all patients sooner or later become the victims of bacterial invasion and that the rôle of infection is a sine qua non in the formation of elephantiasis. These points are relevant in this case, the history of which follows.

### CASE HISTORY.

The patient, a married woman now aged 25, has borne 4 children. The first in 1942 was a normal delivery, the perineum remaining intact. In August, 1944, after a normal delivery at term in another hospital, there was a perineal laceration requiring two silkworm-gut sutures. These were removed on the 7th day, but when the patient went



Fig. 1.

The tumour lying in its natural position and occluding the introitus.



Fig. 2. Showing involvement of the left labium minus only.



Fig. 3. Showing the infected sinus on the outer aspect of the left labium majus.

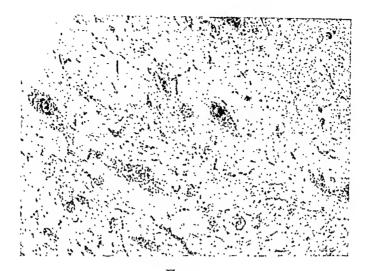


Fig. 4.

Section showing oedematous collagen traversed by vessels with perivascular collections of lymphocytes and plasma cells.

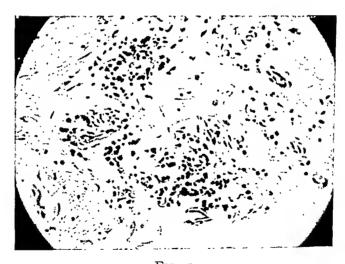


Fig. 5.

High-power view showing inflammatory perivascular infiltrations and two dilated lymphatic vessels.

to the toilet, she felt something pricking her. This was found to be a piece of silkworm gut and was removed. About a month after leaving hospital the glands in both the woman's groins became enlarged and "pus poured from the 4 stitch holes" in her perineum, particularly from the left side. She reported this at the postnatal clinic, and the condition apparently cleared up with treatment. She again became pregnant in March, 1945, but in June a painful swelling developed in the left labium.

On 27th July she made her first attendance at this hospital's antenatal clinic. She was found to have a warty, irregular swelling of the left labium minus, about the size of a small orange, of doughy consistence and slightly tender. There was a contact ulcer on the inner surface of the swelling, and bilateral, small, discrete, painless inguinal glands were noted.

She was admitted to the antenatal ward as she was thought to have blocked lymphatics due to a chronic Bartholinitis. The Wassermann reaction and Kahn test were negative, the gonococcal complement fixation test was negative and no infiltration was detected on X-ray of the chest. Culture of the vaginal swab gave a growth of staphylococcus aureus, and from the vulval ulcer a small growth of staphylococcus albus and diphtheroids was obtained. She was given a course of sulphanilamide and penicillin, and on discharge from hospital the swelling was definitely smaller.

She attended the antenatal clinic regularly until 21st November, when she was readmitted to the antenatal ward, and given a further course of penicillin. The tumour, which had enlarged once more, was suspected to be due to a retained suture.

On 28th November, the patient went into labour and was delivered of a male infant, weighing 7 pounds (3,178 g.), by lower uterine segment Caesarean section. The puerperium was uneventful, but at the postnatal clinic a new indurated area was noted between the left labium majus and the groin. The woman was referred to the gynaecological out-patient's department as it was considered that the tumour should be excised, but she failed to attend.

On 13th December, 1947, she reported to the antenatal clinic when 32 week's pregnant. The elephantiasis of the left labium minus was noted, and she was recommended to wear a T-bandage for support. During subsequent visits, it was seen

that the tumour had so increased in size as to preclude delivery per vias naturales and it was therefore decided to admit her at the 36th week for rest prior to delivery by Caesareau section at term.

On 12th January, 1948, she was admitted to the antenatal ward and her general health was found to be satisfactory. The height of the fundus corresponded to 38 weeks' gestation and the position of the vertex was left occipito-anterior. The Wassermann reaction and Kalın test were again negative. The erythrocyte count was 4,400,000, the haemoglobin 74 per cent, and the white-cell count 7,700. The differential count showed neutrophils, 71 per cent; lymphocytes, 27 per cent; large mononuclears, 2 per cent. There were no eosinophils.

On 21st January she was delivered of a female infant, weighing 6 pounds 10 ounces (3,000 g.) by lower uterine segment Caesarean section. The puerperium was uneventful.

On 25th May she was admitted to the gynae-cological ward. Her general condition and lactation were satisfactory. Examination of the external genitalia showed a large, warty painless swelling of the left labium minus, about the size of a tangerine, which was fleshy in consistence and did not pit on pressure. There was an old sinus about ½ inch (1.2 cm.) in length on the outer aspect of the left labium majus, with a red indurated area above and below. The left inguinal glands were enlarged and painful and there were also a few small, shotty glands in the right groin. No other abnormal physical signs were noted.

On culturing a swab taken from the sinus, there was a moderate growth of congulase negative staphylococcus albus and diphtheroid bacilli. The blood sedimentation rate showed a fall of 15 mm. in an hour. The erythrocyte count was 4,100,000 the haemoglobin 78 per cent, and the total white-cell count was 7,000. The differential count was neutrophils, 50 per cent; eosinophils, 2 per cent; lymphocytes, 44 per cent; and large mononuclears, 4 per cent. There was no growth on culturing a catheter specimen of urine and a vaginal swab.

The patient was given a prophylactic course of 1,400,000 units of penicillin and sulphamezathine 11 g., prior to operation on 2nd June.

Under general anaesthesia, an elliptical incision was made around the base of the tumour, which was then dissected out. A probe was passed into the sinus on the outer aspect of the left labium majus and an incision made down on to the probe. There was a fibrous track and in it was lying a piece of silkworm gut which measured 4 cm. (1.6 inches). The track was excised and the skin edge of the sinus was scarified. The musculo-fascial layers were approximated with interrupted No. 2 catgut sutures which controlled bleeding effectively, and the skin edges were united with interrupted silkworm gut sutures. A drain was not inserted.

The wound healed satisfactorily, as did the opening to the sinus. There was no haematoma. Recovery was uneventful and the patient was discharged on the 15th June.

The pathological report on the tumour was as follows:

"A mushroom-like mass 6 by 4.5 by 4.5 cm., consisting of soft boggy connective tissue and covered by a thick corrugated skin. Histologically the overlying skin is keratotic. The mass consists of wellformed, rather oedematous collagen. This is traversed by arteries, veins and nerves and contains a little elastic tissue. Around the arteries there are frequent focal collections either of lymphocytes or plasma cells (but never both). There are frequent wide vascular channels which are devoid of red cells and appear to be lymphatics. These often contain hystiocytes and sometimes giant cells. The appearances as a whole are typical of elephantiasis and are consistent with lymphatic blockage."

On 14th July, on re-examination, the wound was found to have healed satisfactorily and there was no tenderness on pressure. The patient had not

started to menstruate as she was still nursing her infant.

#### COMMENTARY.

Tuberculosis, syphilis, gonococcal infection and parasitic disease were excluded as of aetiological significance in this case. There is no doubt that the retained piece of silkworm gut was the prime aetiological factor. Lymphangitis and lymphadenitis following the "stitch abscess" led to a sclerosis of the inguinal glands with resultant oedema of the labium. Chronic irritation caused by the retained silkworm gut at the base of the small sinus infected with staphylococci and diphtheroid bacilli helped to keep alive a low-grade infection. The two most important factors in the causation of elephantiasis, according to the literature, were thus present in this case, oedema caused by obstruction of the lymphatic vessels and a superimposed bacterial infection.

I would like to thank Professor J. Young for his help in presenting this case.

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# INTESTINAL OBSTRUCTION IN PREGNANCY

BY

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INTESTINAL obstruction is a rare but serious complication of pregnancy. The incidence is variously assessed at between I in 7,000 and I in 68,000 pregnancies. Smith and Bartlett (1940) found I case amongst 66,431 deliveries in the Boston Lying-in Hospital, while Bemmis (1932) records that the complication arose twice in a review of 15,000 obstetric cases at the Women's Hospital, New York. In the early part of this century the German literature contained many references to the subject, and in 1913 Ludwig collected 95 cases (Table I). At the Postgraduate Medical School of London during the past 12 years there has not been a single case until recent months, when this abdominal catastrophe occurred on 2 occasions—giving an incidence of I in 12,000 pregnancies.

# DISTRIBUTION IN RELATION TO PREGNANCY.

There has been considerable controversy regarding the period in pregnancy when obstruction is most likely to occur. Both Ludwig (1913) and Mikulicz-Radecki (1926) suggest the following incidence:

- (a) During the 4th and 5th month when the uterus ascends from the pelvis.
- (b) During the 8th and 9th month when the foetal head descends into the pelvis.
- (c) During delivery and the early puerperium when there is a marked change in the size of the uterus.

However, of the 2 cases we record in this paper, one occurred at the 28th week and the other at the 12th week of pregnancy.

Age incidence. There appears to be no maximal age-incidence at which the complication may arise—indeed it can occur at any time in the child-bearing period of life. One of our patients was aged 16 years and the other 34.

Aetiology. Textbooks (e.g. Titus, 1937) suggest that any factor known to cause intestinal obstruction in the non-pregnant patient may similarly complicate pregnancy. The word "similarly" is misleading, however, for while it is possible for any or all of these factors to play a part in the production of obstruction in pregnancy, sufficient stress has not been placed on the importance of certain of the factors and the relative unimportance or rarity of others.

In classifying the actiology of acute or chronic intestinal obstruction it is convenient to use the following headings.

(a) Extromural. In this group herniae, adhesions and adhesive bands must be considered.

Cope (1940), in a study of 301 consecutive cases of intestinal obstruction in the non-pregnant patient, found that in 55 per cent the aetiological factor was strangulated hernia. A study of Table I shows that in Ludwig's series of obstruction in preg-

nancy, 7 per cent were the result of herniae, while Eliason and Erb (1937) recorded only 2 such cases or 3 per cent. This low figure has been observed by other authors. Hernial strangulation, therefore, would appear to be relatively rare, no doubt due to the mechanical effect of the enlarged uterus pushing the bowel away from the femoral and inguinal areas. For For the same reason, obstruction of an umbilical hernia would be rare after the 16th week of pregnancy; yet strangulation of an incisional hernia in the upper abdomen might occur at a later period, the possibility diminishing up to the 36th week, and then increasing during the last month of pregnancy, when the uterus descends into the pelvis. Incisional herniae occur with increasing frequency towards the pubis and are comparatively rare above the umbilicus (Bonney, 1944), providing an additional reason for the relative infrequency with which this type of hernia causes obstruction in pregnancy. In passing, however, it would seem reasonable to argue that while the probability of strangulation of the various types of herniae we have mentioned largely diminishes with the growth of the uterus, the rising fundus should enhance the possibility of a loop of intestine passing into a peritoneal recess within the abdominal cavity-especially into fossae about the duodenum or into congenital defects of the diaphragm. Fortunately such defects are extremely rare.

As Table I indicates, adhesions and adhesive bands are the most important factors in the causation of obstruction in pregnancy. An analysis of the figures of all 3 tables quoted shows that these were the cause in 24 per cent of cases. It is possible that this figure is not a true reflection of the incidence of adhesions, because these authors would seem to have been especially concerned with so-called obstruction result-

ing from pregnancy per se. The adhesions are usually of postoperative, occasionally of inflammatory, origin—due to a previous peritonitis. Congenital bands are a rarity.

In a review of general surgical cases Deaver and Ross (1915) and Wangensteen (1942) point out that postoperative adhesions most frequently arise following appendicectomy, especially after drainage through a midline incision, or following operation on the female genital organs. The importance of appendicectomy as an aetiological factor is also stressed by Grey-Turner (1906) who found in the follow-up of a series of 2,500 cases of appendicectomy that 0.8 per cent developed acute adhesive obstruction of the small bowel. While the onset of obstructive symptoms may occur months or years after laparotomy, Deaver and Ross (1915) found that the average time for such symptoms to develop was 24 years. It is not without interest to find that adhesions and adhesive bands form the principal causal factor of obstruction in pregnancy, in view of the frequency with which these factors are associated with tubal occlusion and sterility.

(b) Intermural obstruction. (i) Acute Choffin, Mason and intussusception. Slemons (1937) collected 20 cases from the literature in which intussusception was the aetiological factor. In Ludwig's series intussusception was responsible for 4 cases (4 per cent); Mikulicz-Radecki's (1926) 3 cases (4 per cent); whilst in Eliason's (1937) series there were none. It can be assumed, therefore, that intussusception is a rare complication of pregnancy. Indeed the possibility of invagination of bowel would appear to be less likely during pregnancy because in rising the uterus tautens and elevates the peritoneum from the posterior abdominal wall, providing thus a force tending to cause fixity of the iliocaecal region. It is well to know that the caecum may rise during pregnancy; yet

TABLE I. Collected Cases to 1913 (Ludwig).

				- •	•	٠,	
Aetiolog	у					No. of Ca	ses
Adhesions	•••	• • •	•••		• • •	28	
Volvulus		• • •	•••		•••	13	
Invagination		•••	•••	•••	•••	4	
Pregnancy	•••	•••	•••	•••	•••	10	
Hernia	• • •	•••	•••	•••	•••	7	
Miscellane					urs,		
cysts,	exu	dates,	etc.)	•••	•••	33	
							•
					Tota	l 95	

TABLE II.
Collected Cases 1913-25 (Mukulicz-Radecki).

		<u> </u>				
Actiolog	y			N	To, of Ca	ises
Adhesions				•••	15	
Volvulus		•••	•••		34	
Invaginatio	on	•••	•••	•••	3	
	•••	•••	•••	•••	4	1
Pregnancy	certain	•••	•••	•••	IO	
Pregnancy	uncertain	•••	•••	•••	8	
Unknown	•••	•••		•••	6	
				Total	80	

TABLE III.
Collected cases 1925–35 (Eliason and Erb).

Aetiolog	У				1	No. of Cases
Adhesions	• • • •		•••			14
Volvulus	•••		•••			II
Tumours a	nd c	ysts	•••		.:.	7
Paralytic	(infla	mma	tory)			4
Hernia	• • • •		•••	• • •	•••	2
Pregnancy		• • •	• • •		•••	28
					Total	66

Extracted from tables quoted by Eliason and Erb (1937).

any such elevation is controlled and limited by the peritoneal attachment from below. Indeed, if such were not the case intussusception might be a more frequent occurrence.

(ii) Stricture of the small intestine. As cicatricial contracture of the small intestine is, in the majority of cases, the result of tuberculous ulceration, it is not surprising that we were unable to find any reference to this condition as a complication of pregnancy. The association between abdominal tuberculosis and infertility is well known.

- (iii) Crohn's Disease. Malignant stricture. The age at which the maximal incidence of malignant stricture of the bowel occurs is in the 6th and 7th decades. It will be obvious, therefore, that malignant disease as a cause of intestinal obstruction in pregnancy must be rare. In a review of the literature Banner et al. (1945) found 62 cases of carcinoma of the bowel associated with pregnancy. Should it occur, however, the affected portion of gut will almost inevitably be found in the large bowel-for malignant stricture of the small intestine is an exceptional finding at laparotomy. We have seen one case of carcinoma of the large bowel complicating pregnancy in a patient aged 30 years. The portion of gut affected was caecum and ascending colon. Treatment was by a onestage resection and iliotransverse colostomywith satisfactory result. The operation, however, was performed before the onset of acute obstructive symptoms.
- (c) Intramural obstruction. Intramural obstruction may be due to gall stone, faecal impaction or stercolith. The first of these is characteristically a condition affecting old women and consequently unlikely to occur during pregnancy. Similarly, faecal. impaction is usually found in elderly patients, and in a country where routine antenatal care is the rule should be a very rare aetiological factor. Stercolith formation, often with a foreign body base, such as a fruit stone, is aggravated by constipation. The possibility, therefore, of a stercolith as a causative agent of obstruction in pregnancy must be borne in mind as a possible, although unlikely, aetiological factor.

Volvulus. Ludwig (1913), Eliason (1937) and Mikulicz-Radecki (1926) have shown that volvulus accounted for more than 25 per cent of their total cases of obstruction in pregnancy. Bailey (1946)

states that this condition is relatively common in Eastern Europe—especially volvulus of the sigmoid, because of a relatively long mesocolon—but is extremely uncommon in this country. In addition to affecting the sigmoid, volvulus of the small intestine or the caecum may occur, the former being favoured by the presence of an adhesion from the convexity of the intestinal loop to the parieties or the pelvic organs, while the latter is also favoured by adhesions following appendicectomy and is especially liable to occur when the right half of the colon is displaced, lax and mobile.

From this brief review of the aetiological factors the importance of postoperative adhesions will be noted. As has been pointed out, these are most likely to occur following operations on the pelvic organs, appendicectomy and drainage of the pelvis through the midline incision. seem, therefore, that the gynaecologist can best assist in the prevention of intestinal obstruction in both the pregnant and nonpregnant woman by careful peritonealization of stumps, drainage of the lower abdomen through a stab incision rather than through the midline subumbilical incision, and by refraining from appendicectomy as a routine part of all gynaecological operations!

There is a sharp divergence of opinion regarding the possibility of pregnancy per se causing obstruction. Leonard (1917) states that "normal intrauterine pregnancy rarely, if ever, causes acute intestinal obstruction." Wilms and Pinard (quoted by Eliason, 1937) agree that it is the "rarest of conditions". On the other hand the authors we quote, in the accompanying tables, show that pregnancy alone was the aetiological factor in 20 per cent of all the cases—indeed in Eliason's series it was the chief single agent in the production of the complication.

These figures, however, can be misleading for, as Eliason states, it is probable that many cases of obstruction due to the usual aetiological factors, such as adhesions, etc., have not been considered of sufficient interest to report in later years. He suggests that the relative incidence of 10 cases due to pregnancy itself out of 95 cases (Table I) is probably a more accurate figure.

Cases of intestinal obstruction in pregnancy without any obvious aetiological factor are said to have been "proved" at autopsy. In the majority of such cases the obstruction has been found low in the sigmoid colon—where the latter crosses the Stoeckel (1929) coninnominate line. siders that there may be an atony of the gut produced by some disturbance of the autonomic nervous system and that this may be related to a pre-existing severe pyelitis with marked stasis and dilatation of the ureter. If this theory is correct, it is interesting to find that the site of the obstruction is on the left side, whereas in pyelitis of pregnancy it is the right ureter which undergoes greatest change. Moreover the uterus tends to rotate to the right during pregnancy and in a number of cases the infection of the renal tract is probably secondary to the stasis in the ascending colon. For these reasons one might expect the obstruction to affect the right bowel quadrants, rather than the sigmoid colon. Possibly the more sensitively balanced neuro-muscular mechanism and the solid faecal content of the pelvi-rectal area prove the determining factor.

Mechanical factors such as hydramnios, foetal abnormalities, e.g., hydrocephalus causing a marked increase in the size of the uterus, have been considered by various authors, but discarded because so rarely are pregnancies associated with such abnormalities complicated by intestinal obstruction. However, as Eliason (1937)

points out, in pregnancy the female is more constipated than usual and if, to this manifest lack of tone, other elements are added one can conceive that the pressure of the pregnant uterus may assist in sinister developments.

It appears, then, that intestinal obstruction is less common in the pregnant than it is in the non-pregnant woman of the same age. The lower incidence of the complication is probably due to two factors: firstly, that hernia is relatively uncommon in pregnancy and, secondly, that conditions favourable to the development of obstruction—chiefly post-inflammatory adhesions—are more frequently associated with sterility.

Yet, should pregnancy develop in a patient with peritoneal adhesions, certain mechanical factors tend to precipitate obstruction. These will be discussed later in this paper. Here we would emphasize that intestinal obstruction must always be considered when acute abdominal symptoms develop in pregnancy. Let an abdominal scar on a pregnant woman be a line of evidence denoting potential obstruction.

#### CASE HISTORIES.

CASE I. A recently married pregnant girl aged 16 years was admitted to hospital on July 20th 1947, with severe, intermittent abdominal pain of 13 hours' duration and frequent vomiting for 11 hours. She had an appendicectomy in 1945, performed as an emergency operation through a subumbilical incision and without drainage.

Last normal menstrual period, January 10th, 1947. Expected date of delivery October 17th, 1947. The patient booked at our antenatal clinic on April 9th, 1947. No abnormality was discovered and she was referred to her local clinic for supervision until the later weeks of pregnancy. She was well until she was walking home on the 19th July, at 10.10 p.m., when she developed severe epigastric pain, constant at first, later becoming intermittent. At 11.30 p.m. she experienced nausea and vomited about every half-hour until admission

to this hospital II hours later. Shortly after the pain commenced, the patient began to hiccough, and to experience frequency of micturition but no dysuria. Foetal movements were present. Following appendicectomy in 1945 the girl made a good recovery and there was no history of pain or distension. She had been mildly constipated during her pregnancy.

Temperature 98°F.; pulse 82, good volume: respirations 20. She was pale and there was puffiness of the lower eyelids; the tongue was clean but dry; the skin moist; breathing normal; heart and lungs normal; blood-pressure, 110/70. There was slight bilateral tenderness on deep palpation of the renal angles. The abdomen had good musculature; there was no distension. The uterine fundus was at the level of a 28 weeks' gestation. The uterus was not tender or hard; the foetal heart was heard. No extrauterine mass was palpable. There was an area of tenderness on deep palpation in the epigastrium extending down to the right iliac fossa. There was no rigidity, hyperaesthesia or rebound tenderness detected.

Vaginal and rectal examination revealed no abnormality. Urine: specific gravity 1020, no albumin, acetone or organisms.

Urinary chloride 2 g. per litre. Haemoglobin 86 per cent.

Progress and Treatment.

July 20th. Condition improved until 6 p.m. when the patient vomited a small quantity of yellow fluid. A litre of 10 per cent glucose saline was given intravenously and followed by 500 ml. of 5 per cent glucose in water, calcium gluconate 10 ml. of 10 per cent solution 4 hourly, and sulphadiazine 1 gram, 6 hourly, administered by the intravenous drop.

July 21st. Condition remained satisfactory; pallor less marked; tongue dry. The patient vomited 3 times during the night (25 ounces) and complained of slight abdominal pain for approximately 15 minutes at 6 a.m. There was no associated nausea. On examination there was some slight epigastric distension. Blood urea 25 mg. per cent. Blood-uric acid 4 mg. per cent. Urine: specific gravity 1025; no albumin; a trace of acetone; no leucine or tyrosine crystals.

6 p.m.—Temperature 99.4°F., pulse 100; blood-pressure 135/80. There was no vomiting; the

abdominal distension had increased; the bowel sounds were high-pitched. A turpentine enema was given with good result.

23rd July, 6 p.m. The patient vomited twice in 12 hours (18 ounces). Epigastric distension increased without pain. A Ryle's tube was inserted and the stomach aspirated half-hourly. A further 1,000 ml. of 5 per cent glucose saline with 50 units of insulin were administered intravenously.

24th July. The patient was restless with frequent hiccoughs. Attempts to insert a Miller-Abbott tube past the duodenum failed and X-rays revealed multiple fluid levels in the small gut.

4.30 p.m. Laparotomy under gas, oxygen and ether using a subumbilical midline incision. A small quantity of straw-coloured, free fluid was found in the peritoneal cavity. The uterus was noted to be the size of a 28 weeks' cyesis. The ileum was seen to be distended and the caecum collapsed. Good exposure was assured by gently holding the uterus over to the left. A firm but vascular adhesive band was noted passing from the caecum about 2 inches above the iliocaecal junction to a loop of ileum. Behind and constricted by this band was a second loop of ileum. The band was divided and the caecal end implanted into the wall of the caecum by a purse-string suture. The constricted ileum proved to be viable. The Miller-Abbott tube was then milked down to third part of the duodenum but shortly afterwards the tube receded back to the pylorus. Finally the abdominal wall was closed in layers.

Postoperative sedation included injections of omnopon together with progesterol mg. x b.d. Prophylactic penicillin 100,000 units 6 hourly, and 1,000 units of heparin were added to each litre of intravenous fluid. The Miller-Abbott tube became partially blocked despite sodium bicarbonate clearance wash-outs, and a Ryle's tube was also inserted. Gastro-duodenal tubes were removed on third day following disappearance of distension and satisfactory enema.

On October 17th she had a normal delivery of a 7 pounds 6 ounces healthy male child. Her puerperium was uneventful.

Case 2. Mrs. E. E., aged 34 years; para 2, was admitted to hospital on September 17th, 1947, with acute colicky abdominal pain of 42 hours' duration.

In 1945 she had a myomectomy and Baldy-Webster uterine suspension.

In 1935 and 1937 she had full-time normal deliveries. Last normal menstrual period, June 26th, 1947. Expected date of delivery, April 3rd, 1948.

While stepping on to a bus at 8 a.m. on September 15th, the patient experienced a sudden stabbing pain in the right lower abdomen. The pain was momentary, unaccompanied by nausea, sickness or faintness, so that she was able to continue her journey and carry out her household duties during the day. At 5 p.m. the same evening, whilst sitting at tea, the pain recurred and lasted for approximately 30 minutes. On this occasion there was nausea but no vomiting. For the next 24 hours she felt well and there was no further pain until 5 p.m. September 16th, when she had a third attack of pain, still confined to the right lower quadrant of the abdomen, which lasted only a few minutes She paid little attention to this and accompanied her husband to the cinema. At 8 p.m. while watching the film, she was suddenly seized with a very violent recurrence of colicky pain which, on this occasion, radiated from the right lower abdomen to the epigastrium. It was intermittent, each attack lasting approximately 30 seconds, recurring every 10 minutes, and associated with frequent vomiting of small quantities of fluid.

She was admitted to hospital r hour later (9 p.m. September 16th). She stated her bowels opened regularly, and that there had been a satisfactory stool 12 hours prior to admission. She did not give a history of rigors or urinary symptoms.

Temperature 97.6°F.; pulse 68, respirations 20 Her appearance was healthy; her facies were anxious but of good colour; the tongue was moist and furred; heart and lungs normal. Blood-pressure 132/90. There was no tenderness in costo-vertebral angles. The abdomen was slightly distended; there was moderate generalized tenderness over the whole abdomen but most marked in the right lower abdomen. Where slight rigidity was detected. The fundus uteri was just palpable above the symphysis pubis.

Vaginal examination revealed an anteverted, mobile uterus enlarged to the size of a 12 weeks' gestation; the cervix was soft and the os closed; a moderate degree of tenderness was detected on bimanual examination through the right formix; no extrauterine mass was palpated.

Urine: Trace of acetone.

An enema yielded a bulky faecal result.

The case was obviously an acute abdominal emergency and a provisional diagnosis of acute intestinal obstruction complicating pregnancy was made. Laparotomy was performed without delay.

Laparotomy under pentothal, gas, oxygen and ether, using a subumbilical midline incision. A moderate quantity of straw-coloured fluid was aspirated from the peritoneal cavity. Distended coils of ileum presented through the abdominal wound. The uterus was noted to be enlarged to the size of a 12 weeks' gestation. There was considerable distortion of the broad ligament and an absence of the round ligament folds in front. The left Fallopian tube and ovary were densely adherent to the posterior aspect of the uterus with the fimbriae of the tube located to the right of the midline. A coil of ileum was closely incorporated in this tubo-ovarian adhesion and in addition entered depression near the right cornua of the uterus, to which it was so densely adherent for approximately 3 inches that it could only be freed with difficulty by sharp dissection, leaving a cavity which was subsequently closed with catgut. The raw areas of bowel were infolded with continuous atraumatic sutures after the viability of the gut had been established. Adequate patency ensured, the abdomen was closed in layers.

A Ryle's tube was inserted following operation and the gastric contents aspirated 2 hourly by means of a 20 ml. syringe. Fluid and salt balance were maintained by means of an intravenous drip. Omnopon gr. ½ was administered by injection 1 hour after operation and repeated in 8 hours. Progesterone mg. x b.d. was given as a prophylactic against possible abortion.

The patient made an uneventful recovery and was discharged from hospital on the 17th day following operation. She attended the antenatal clinic subsequently, when the pregnancy was noted to be continuing undisturbed.

# DISCUSSION OF CASE RECORDS.

It is generally accepted that there is a high maternal mortality associated with intestinal obstruction in pregnancy. Study of 3 tables quoted in part in this paper show that the mortality varied between 21 per cent and 54 per cent, which compared with

an over-all mortality-rate of about 30 per cent found with obstruction in the nonpregnant patient. This in great part is a mortality resulting from delay in treatment coupled with the difficulty in operative procedure.

A careful appreciation of dehydration and adequate stabilization of the daily salt-water balance will do much to improve mortality figures. We can lay little stress on the biochemical assessment of dehydration because blood changes are late in appearance and misleading. It is suggested that a common fault is to underestimate the amount of fluid required. Fluid loss amounts to 1,500 ml. per day if water intake is stopped (2 per cent of body weight). Aird (1948) estimates that a non-pregnant patient with obstruction and presenting clinical evidence of dehydration has lost about 6 per cent of body weight and will need therefore at least 8 litres of fluid in the 24 hours following admission (which figure includes 200 ml. per hour to replace intestinal juices, evaporation and urine output and 4.2 litres to replace fluid already lost). Her salt needs—5 g. per day added to about 20 g. of salt which may be presumed as lost before admission—can be supplied as normal saline and the remainder of the fluid given as glucose water. A further 5 g. of salt should be added for every litre of vomited or aspirated gastro-intestinal fluid. The number of litres required multiplied by 12 gives the rate of drip per minute. It is important to note that these figures refer to the replacement of salt and fluid in the dehydrated non-pregnant patient. quantities required are large and it is probable that less fluid is required to relieve dehydration of a corresponding clinical level in the pregnant patient. It would seem that the pregnant woman presents clinical evidence of dehydration more quickly and with less fluid and electrolyte loss than would be necessary to produce a

similar state in the non-pregnant woman. The duration of pregnancy would be another determining factor.

We would agree with Marriott (1947) that 24 hours is too long a time for periodic reviews of the output, and this is especially true should labour have commenced. Care must be taken lest excessive salt be administered; yet in pregnancy more water can be replaced without the fear that it will not be retained unless covered by additional salt therapy. Excessive salt will increase the strain on already overworked kidneys, especially during pregnancy, when the minimum excretory volume of urine will be raised to cope with extra waste products. In treating dehydration, the Fantus test (for urinary chloride) is of value and has the advantage of being a rapid sideroom test; also useful are serial urinary volume and specific gravity readings. Again we would emphasize that a careful clinical assessment is of paramount value. It is apparent that until we have a more exact appreciation of fluid-electrolyte changes in normal pregnancy, we cannot hope to accurately gauge replacement under pathological conrequirements ditions.

In case I the obstruction resulted from a post-appendicectomy adhesion between a loop of ileum and the caecum. It is suggested that in this type of lesion a mechanical factor tending to precipitate obstruction might be similar to that considered as a cause of intestinal obstruction following an abdomino-perineal resection of the rectum. In this procedure a wide peritoneal resection may result in a traction descent of a loop of ileum. It is possible that the rising uterus may similarly pull down the posterior parietal peritoneum and thereby cause a loop of ileum to be drawn down. Contrariwise other parts of the small intestine may at the same time be pushed upwards in the abdomen.

In case 2 it will be seen that the offending adhesion was related to the posterior surface of the broad ligament and uterus which had been ventrisuspended by the Baldy-Webster technique. No herniation of bowel into a broad ligament fenestra could be detected in this case, such being the well-known occurrence resulting in intestinal obstruction after this operation (Schumann and Beecham, 1939, record two such cases).

It will be noted in case I that 3 days elapsed before laparotomy was performed. At operation, however, the patients general condition was satisfactory and this we attribute to adequate fluid and salt replacement therapy. It is known that whilst expectant treatment may prove satisfactory in certain simple obstructions, unsuspected strangulation will be unnecessarily fatal in others. "In some quarters the introduction of suction drainage has given a fall in the fatality rate of occlusion but a rise in that of strangulation, operation in the latter condition being sometimes dangerously delayed by failure to distinguish it from occlusion" (Aird). addition it seems reasonable to assume that when the metabolic changes which occur in intestinal obstruction are superimposed on the unstable metabolism of the pregnant woman, more particularly salt water and acid base equilibrium, the outlook must be regarded as more serious. We are reminded of two surgical dicta, first that "operation, must be prompt but not precipitate" (Wilkie, 1932), and secondly the adage quoted by Vick (1932) that "if you put a patient on the table cold, you will take him off colder."

Abdominal distension may be slow to appear. In case I distension was not detected until 36 hours after the initial symptoms. In case 2 distension was only very slightly evident prior to operation. It would appear that despite atonicity of

the bowel in pregnancy, distension may be late in appearing—a feature frequently noted with obstruction in the non-pregnant.

In case I it proved impossible to pass the Miller-Abbott tube beyond the pylorus until operation, when it was milked down into the third part of the duodenum. However, prior to closure of the abdomen the tube was noted to have receded to the pylorus and required replacement. Anti-peristalsis may have caused this regression. Further, partial blockage of the tube occurred shortly after operation, necessitating the additional use of a Ryle's tube. Difficulty in the correct positioning of the Miller-Abbott tube has been noted in the nonpregnant state, and we are of the opinion that pregnancy increases this difficulty on . account of the enlarged uterus. Moreover, the greater the degree of obstruction, and therefore the greater the need for intubation, the greater is the difficulty in passing the tube. This would appear to be due to a kink resulting from forward displacement of the stomach and duodenum. Therefore in order to ensure that the tube has been correctly positioned, and has not curled up inside the stomach, check radiography for the position of the tip of the tube is more than ever essential. Where difficulty is experienced with the Miller-Abbott tube, a Ryle or Wangensteen tube passed into the stomach will enable the gastric contents to be aspirated. This procedure was adopted in both cases. Certainly vomiting will be relieved and gastric contents prevented from passing to the distended loops below, yet adequate decompression of these loops will not be achieved without the Miller-Abbott or similar intubation. This difficulty in satisfactory decompression in the pregnant woman is yet another argument for early surgical interference. We nevertheless believe an attempt at Miller-Abbott intubation worth while. The passage of such a tube before operation has the

advantage that it reduces anaesthetic vomiting and facilitates intra-abdominal manipulation. The dangers of laryngeal oedema, bowel perforation and inability to retract the tube through coiling are rare. While intubation suction is being maintained, it is well to limit fluid by mouth to not more than 120 ml. 4 hourly, lest salt be washed out and the salt balance be further upset.

In both cases care was taken to exclude a renal tract infection which, as we have stated, may very rarely occur as an associated complication.

#### DIAGNOSIS.

No attempt will be made to discuss diagnosis in detail but only to emphasize certain features.

The 4 cardinal signs of obstruction, vomiting, colic, distension, and absolute constipation may not always be present. The added difficulty is that these signs are frequently associated with a pregnancy uncomplicated by obstruction.

The question will always arise, Is the vomiting obstructive or non-obstructive? In this respect mention will only be made of two adjuncts in diagnosis—radiological and diagnostic enema.

1. Radiographic diagnosis. normally present in the colon can generally be evacuated by an enema, so that if the colon remains distended with gas after this has been administered, an obstruction is almost certainly present. The presence of gas and fluid levels in the small intestine is definite evidence of obstruction. Incomplete obstructions are more problematic. For example, in partial obstruction of the ileum, gas may be present in both the colon and ileum. After evacuation of the gas in the colon by an enema, more gas may descend from ileum to replace the removed sample. The disappearance, or otherwise, of gaseous distension noted by serial radiographs provides a useful guide to the success of treatment. Further if, after the colon is emptied of gas, the small intestine remains distended, obstruction of the latter is present.

2. Enema diagnosis. If fluid from a half-pint saline or salt and water enema is returned only slightly coloured and unaccompanied by flatus, obstruction can be assumed to be complete. However, results from enemas are frequently difficult to interpret by nurse and later by surgeon, and in recent obstruction a "satisfactory faecal result" may be obtained. The value of comparison radiographs before and after enemas has been mentioned. Strangulation should be suspected if the enema is blood-stained.

The immediate recognition of strangulation is essential. Useful guides are the poor general condition of the patient, the rising pulse (usually little altered in simple obstruction), frequently increasingly severe colicky pain, rebound tenderness, and persistence of pain for longer than 2 hours following adequate gastro-duodenal drainage. Should strangulation be suspected, operation must be immediate. With simple obstruction, pre-operative correction of salt water deficiency is generally advisable.

With many others, we agree that pressure of the pregnant uterus will rarely if ever cause obstruction. It is said that such an obstruction occurs in the recto-sigmoid area, yet we know that obstructive signs are very slow to develop in this area. Moreover, in the experimental animal, simple occlusion at a corresponding site can be maintained for a month or more without symptoms.

It is significant that in the two largest collected case series of intestinal obstruction, 6,892 cases collected by Vick (1932), and 3,064 cases collected by Souttar (1925), reference is made to obstruction in pregnancy. The over-all mortality in Vick's

series was 26.2 per cent, and the mortality in obstruction resulting from adhesions 32.9 per cent. This was before the general introduction of suction and saline therapy.

A close examination of the case histories recorded by Eliason and Erb in their paper on intestinal obstruction in pregnancy suggests that at least two of their patients did not have true obstruction; ileus possibly. Thus one often meets with a patient who within a few days following a laparotomy develops symptoms suggestive of organic obstruction, but who almost invariably responds to conservative measures. We have tried to emphasize the importance of deciding whether or not organic obstruction exists in any particular patient. In one of Eliason's cases, vomiting persisted and distension appeared after an appendicectomy performed at the 6th month of pregnancy. Symptoms were relieved by an enema. In a second case signs of obstruction at the 4th month were relieved by an enema given in the knee-chest position, considered by the above writers to have relieved the effect of pressure by the pregnant uterus. In their third case, obstructive signs appeared at 5th month of pregnancy and were relieved by a caecostomy followed by a surgical induction! We note that both these patients gave a history of appendicectomy.

Chronic constipation is so common in pregnancy and may closely simulate acute intestinal obstruction, particularly if impacted faeces become tightly lodged in the colon. In such circumstances an adequate enema will generally give relief and sufficient flatus be passed to prevent serious distension.

### SUMMARY.

Two cases of pregnancy complicated by intestinal obstruction are recorded. The obstruction in the first case was the result of a post-appendicectomy adhesion, and

in the second case followed a Baldy-Webster ventrisuspension operation.

The incidence, aetiology, diagnosis and treatment of intestinal obstruction in pregnancy are discussed. Emphasis is placed on the importance of considering intestinal obstruction in evaluating acute abdominal symptoms in pregnancy.

These cases have been published at the instigation and with the help of Professor James Young, Director, and we wish, too, to thank Professor Ian Aird, who advised on the care of Case I, and who helped us greatly with his advice.

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## A CASE OF INTESTINAL OBSTRUCTION ASSOCIATED WITH A RUPTURED ENTEROCELE

BY

WALTER THOMPSON, M.B., F.R.C.S., Surgical Chief Assistant, Manchester Royal Infirmary

A REPORT by Daley and Callum (1946) of "A Case of Intestinal Obstruction Associated with Complete Procidentia" prompts me to report the following case.

History. About 6 p.m. on 4th October, 1947, a lady of 61 years was admitted to the Manchester Royal Infirmary complaining of "something having come down" suddenly 4 hours previously, and of severe lower abdominal pain. Eight years ago she had had a colporthaphy performed and for the past 6 years "something had been coming down," but she had always been able to replace it.

Examination. A loop of purplish, very swollen, large bowel could be seen protruding from the vulva. Increased peristaltic sounds were present on abdominal auscultation and the patient looked pale and shocked.

Operation. Under low spinal anaesthesia the prolapsed loop of bowel was carefully cleansed with saline and the vulva and vagina washed out with Dettol solution. On exploration of the vagina a loop of bowel was found to be coming through a hole, one inch in diameter, in the posterior fornix. The loop could not be replaced so the posterior vaginal wall was slit downwards in the midline. The loop of bowel now gradually changed colour and there was no sign of necrosis at the constriction ring; the vessels in the mesentery could be felt to be pulsating normally and there was no venous thrombosis. After further cleansing, the viable pelvic colon was returned to the abdominal cavity. The peritoneum was stripped from the vaginal vault and closed separately. The operation was then completed by a normal posterior colporrhaphy and perineorrhaphy. There was no ptosis of the anterior vaginal wall and therefore an anterior colporrhaphy was unnecessary.

Postoperative course. The patient progressed

very favourably and the temperature remained normal throughout convalescence: no complications developed. When last seen in February 1948, she stated that she had never felt better.

### DISCUSSION

No cause could be discovered for the sudden rupture of the hernia of the vaginal vault. There is no doubt that there was a localized area of weakness high up in the posterior vaginal wall following the previous colporrhaphy operation. The site of rupture was carefully examined and showed no evidence of recent mechanical trauma or inflammation. It would appear that the rupture had occurred with some normal rise of intra-abdominal pressure, the hernia of the pouch of Douglas having become thinned out at one side. This case was successfully dealt with from below, but at the time of commencing treatment we could not be sure whether the loop of gut was viable; however, after releasing the constriction ring, this problem was settled. Further, the bowel was easily brought down and it would have been possible to perform a resection and end-to-end suture from below. If this had been necessary the operation would, of course, have been completed by an abdominal colostomy.

I would like to thank Mr. A. H. Southam, M.D., F.R.C.S., for allowing me to publish this case.

#### REFERENCE.

Daley, D., and Callum, E. N. (1946): J. Obstet. Gynaec., 53, 68.



JAMES HAYWARD WILLETT

### Obituary

## IAMES HAYWARD WILLETT

M.D., F.R.C.O.G.

James Hayward Willett died in Tarporley, Cheshire, on July 13th, 1948. He was born on October 20th, 1875, and was educated privately in Chester, and at Victoria University, where he qualified M.B., in 1897. Younger readers may not know that Victoria University was the name given to the combined body formed by Owen's College, Manchester, and the University Colleges of Liverpool and Leeds before each of these became unversities in their own cities. This change had taken place by the time Willett obtained his M.D. (Liverpool) in 1908.

After he had held some house appointments, the South African War had started, and Willett volunteered for service as a medical officer. He was attached to the 1st Dragoon Guards and for his service received the Queen's South African medal with three bars—Orange Free State, Transvaal, Laing's Nek. The excitement of war was for him coloured by romance, for it was during his service in South Africa that he met the lady, Gertrude Ellen Serridge, who became his wife.

When he returned to Liverpool he devoted himself to obstetrics and gynae-cology. He was appointed to the staff of the Hospital for Women in 1902 and to that of the Maternity Hospital in 1909. In 1905 he was appointed Demonstrator and Subcurator of the museum in the Department

of Obstetrics and Gynaecology in the University of Liverpool under Professor Briggs. At that time Professor Briggs was developing and expanding the museum, and Willett gave a great deal of time and devoted service to mounting, describing and arranging specimens. He remained actively working in the department until 1911.

He was a Foundation Fellow of the Royal College of Obstetricians and Gynaecologists.

Willett was a retiring man of a very quiet disposition. He wrote little, but was an active member of the North of England Obstetrical and Gynaecological Society which he joined in 1901, and of which he was President in 1914, but in this year war again intervened and he never had the opportunity to deliver his presidential address.

As a gynaecologist his diagnostic ability was considerable, but in the years when the writer knew him his operating was handicapped by poor eyesight. As an obstetrician he excelled and he was the master of the various vaginal manipulative manoeuvres. He insisted on an assessment of the weight of the expected child by palpation of the mother's abdomen long before this was accepted practice and was himself so skilled that his own estimates were rarely more than a quarter of a pound out. His name will

always be associated with the foetal scalp forceps he contrived for use in cases of placenta praevia.

He was a capable, painstaking and patient teacher whose students were genuinely fond of him.

Those of us who were privileged to know

him will remember him as a very kindly and helpful senior whose excellent obstetrical judgement and skill would have been more widely known had he been of a less shy and sensitive character.

Dr. Willett survived his wife and had no children.

## ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

A meeting of the Council was held in the College House, on Saturday, 24th July, 1948, with the President, Sir William Gilliatt, in the Chair.

SIR WILLIAM GILLIATT, C.V.O., M.D., M.S., F.R.C.P., F.R.C.S., was re-elected President.

The following officers were also re-elected:

Vice-Presidents.

SIR WILLIAM FLETCHER SHAW, M.D., M.M.S.A.(Hon.), F.R.C.O.G. JAMES M. WYATT, F.R.S.C., F.R.C.O.G.

Honorary Treasurer.

ARTHUR A. GEMMELL, M.A., M.D., F.R.C.S.E., F.R.C.O.G

Honorary Secretary.

HUMPHREY G. E. ARTHURE, M.D., F.R.C.S., M.R.C.O.G.

Honorary Librarian.

FREDERICK W. ROQUES, M.A., M.D., M.Ch., F.R.C.S., F.R.C.O.G.

Honorary Curator of the Museum.

ALECK W. BOURNE, M.B., B.Ch., F.R.C.S., F.R.C.O.G.

The following were admitted to the Fellowship of the College:

Francis\_Richard William Kinkead Allen.

James Bruce Dewar. Peter Joseph Kearns. Hector Joseph MacLennan. George Randolphe Sparrow.

The following were admitted to the Membership of the College:

Sydney Graham Aitken. Islay Cecil Barne Wallace Barr. Fred Benjamin. Arthur Baillie Higginson

The following candidates were elected to the Membership of the College:

Tariq Munir Abbas.
Ian Struan Robertson Bain.
Henrietta B. Banting.
Trevor Lewys Stanhope Baynes
Samuel Behrman.
Douglas Charles Aitchinson Bevis.
Charles Christopher Bowley.
Tristam St. Vincent William Buss.

Lloyd Woodrow Cox.
Thomas Elliot Elliot.
Premavathi Maddimsetti Haidu.
Mary Elizabeth Egerton.
Margaret Fitzherbert.
Gilbert McIlwrick Forsyth.
Harold Derek Freeth.
George Barton Gibson.

John Hartley Gibson. Andrew Graham. Alfred Henry Grenz. Constance Amy Grey. Harold Bickford Hattam. Carl Clifford Henneberg. Ebbie Hesselberg. Dennis Woodfall Higson. John Colgate Holman. Kenneth Robert Hudson. Alun Gareth Jones. James Barclay Joyce. Roshan Ardeshir Irani. William Thomas Kenny. George Gladstone Kerster. Robert Arthur Hugh Kinch. Samuel Lask. Thomas Loftus Townshend Lewis. Ethna West Little. Biohn Lynn Forsyth McConnachie. William Macfarlane. John Macdonald McKiddie. Stephen Herbert Madden. Helen Margaret Mayer. Gordon William Heyes Millington. Frank Lionel Edward Musgrove. Charles Godfree Nairn. James Raymond Norris. John Joseph Francis O'Sullivan. Joseph Henry Patterson.

Anthony Cecil Pearson. William Henry Peck. Stanley Dreland Perchard. David Prysor-Jones. Mohammad Siddique Qureshi. Edward Harford Rees. Stanley Mckae Reid. Hujohn Armstrong Ripman. Donald Norman Struan Robertson. Helen Margaret Russell. Basil Walter Sanderson. Humara Sayeed. Saran Abdulkadir Siddiki. George Alfred Silley. Alan Ambery Smith. Tom Smith. George John Sophian. Christine Margaret Stacey. Patrick Christopher Steptoe. Christopher Seymor Newton Swan. Ralph Arnold Thatcher. Gwyn Stuart Thomas. Robert George Whitelaw. Philip de Silva Wijesekera. Rhys Meyrick Williams. Martin Sadler Williamson. Harold Geoffrey Wolskel. Peter Spence Wright. Ratcliffe Bowen Wright

## THE TWELFTH BRITISH CONGRESS OF OBSTETRICS AND GYNAECOLOGY, JULY 1949

To be held in the Friends Meeting House, Euston Road, London.

President: SIR EARDLEY HOLLAND.

Hon. Secretaries: A. Joseph Wrigley and Ian Jackson.
58 Queen Anne Street (Royal College of Obstetricians and Gynaecologists),
London, W.I.

### WEDNESDAY, JULY 6TH.

Morning Session, 10.0 a.m. (Chairman: THE PRESIDENT).

The Congress will be declared open by the Minister of Health.

"Modern Caesarean Section."

Introduced by Mr. McIntosh Marshall (Liverpool).

Afternoon Session, 2.0 p.m.

- (1) Guest Paper. Dr. Joe Meigs (Massachusetts).
- (2) "Pregnanediol."

Introduced by Prof. C. F. Marrian (Edinburgh) and Dr. G. I. M. Swyer (London).

### THURSDAY, JULY 7TH.

Morning Session. 10.0 a.m.

"Essential Hypertension in Pregnancy."

Introduced by Prof. George Pickering (London) and Prof. F. J. Browne (London).

Afternoon Session, 2.0 p.m.

(1) "Hernia of Pouch of Douglas."

Introduced by Mr. Charles Read (London).

(2) "The Management of Pregnancy in Diabetics."
Introduced by Mr. John Peel (London) and
Prof. D. M. Dunlop (Edinburgh).

FRIDAY, JULY 8TH.

Morning Session, 10.0 a.m.

"Diagnosis and Prognosis of Carcinoma of the Uterus."
Introduced by Dr. J. E. Ayre (Montreal) and
Dr. Spears (Cambridge).

Afternoon Session, 2.0 p.m.

Discussion on Maternal Mortality.

Introduced by Sir William Gilliatt (London).

Owing to the difficulties that exist at the present time in arranging hotel accommodation, travel, etc., the Hon. Secretaries would like to have the names of those who hope to attend by March 31st, 1949, at the latest, and, if possible, very much before that date.

### BRITISH MEDICAL ASSOCIATION

# THE KATHERINE BISHOP HARMAN PRIZE for the encouragement of Research into the Disorders Incident to Maternity

The Council of the British Medical Association is prepared to consider an award of the KATHERINE BISHOP HARMAN PRIZE in the year 1949. The value of the Prize is £75.

The purpose of the Prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing. It will be awarded for the best Essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the Prize.

Any medical practitioner registered in the British Empire is eligible to compete.

Should the Council of the Association decide that no Essay submitted is of sufficient merit, the Prize will not be awarded in 1949, but will be offered again in the year next following this decision, and in this event the money value of the Prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each Essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address.

Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than 31st December, 1948.

Inquiries relative to the Prize should be addressed to the Secretary.

CHARLES HILL. Secretary.

British Medical Association House.

Tavistock Square, London, W.C.1.

April 1948.

### **BOOK REVIEWS**

"Operative Gynaecology." By H. S. Crossen, M.D., and R. J. Crossen, M.D. Sixth edition. London: Henry Kimpton, 1948. Price 75s. net.

In 1915 H. S. Crossen stated the objective of his first edition to be the selection of treatment best suited to a particular patient by an operator, familiar with the pathology of the pelvis and with the various operative procedures available, after careful study of the individual case. In this sixth edition the authors reaffirm that selective treatment is their aim.

The details of operative technique and clinical management of patients before and after operation are thoroughly and clearly described and well illustrated. There are special chapters devoted to the Urinary Tract, the Intestinal Tract, and to Nervous and Mental Symptoms in Gynaecological Surgery. In this country the name of McIndoe will be missed from the account of treatment for Absence of the Vagina, and the name of Millin from the section on Defective Urinary Control. The radical abdominal operation for cancer of the cervix appears under the heading "Operations of Historical Importance", perhaps the sections on Vaginal Hysterectomy for Radium Implantation, Abdominal operation for Radium Implantation and Needle Treatment of Parametrium (Interstitial Radiation) would be more appropriately so described.

In the chapter on Myoma of the Uterus, an interesting section describes the experience of the authors in radiation therapy of uterine myoma, with a discussion of indications, limitations, and critical analysis of results, the typical case being a patient of climacteric age with a medium size myomatous uterus, bleeding as a principal symptom, and the pelvis otherwise clear. In regard to the influence of myoma radiation on the incidence of subsequent uterine and ovarian malignancy a decided reduction is claimed; each type of malig-

nancy was more than twice as frequent in the non-radiated cases as in those given radiation therapy.

Chief emphasis in this edition is on the prevention of cancer. For chronic cervicitis, with or without suspicion of early malignancy, conical excision by the electric cutting wire is recommended in preference to cauterization or coagulation, so that microscopic examination of all tissue removed may be made. For delayed menopause and erratic menopausal bleeding the possibility of endometrial malignancy calls for careful examination: if no local disease is found, radium treatment to suppress endometrial activity the ovarian and recommended. There is a lengthy discussion of the menace of "silent" ovarian carcinoma, where insidious spread of the disease beyond hope of cure so often precedes the onset of warning symptoms. The sections dealing with leucoplakic vulvitis and cancer of the vulva based on the work of Taussig are excellent, the descriptions of the lymphatics of the external genitals being from Sappey, from Poirer, and from Cunéo and Marcille.

There are many warnings, and references to several critical analyses of postoperative deaths. The book is well printed, convenient to handle, amply illustrated, pleasant to read, and throughout, reflects long experience and mature judgement.

"Textbook for Midwives." By WILFRED SHAW, M.A., M.D., F.R.C.S., F.R.C.O.G. 689 pages, 223 illustrations. London: J. and A. Churchill, Ltd.

THE author decided to write this book after experience of teaching pupil midwives during the war. He holds the view that "a midwife performs one of the most vital duties in modern society, and that her importance is neither realized nor sufficiently recognized." He is convinced that "the status of

midwives will be improved far beyond what it is at present, and that ultimately midwives will hold a position intermediate between that of a trained nurse and a general practitioner." Because of these beliefs, the author has attempted to incorporate in the book details and descriptions of importance to a student on the level of the Sister Tutor. A glossary has been introduced to explain unfamiliar terms.

Mr. Shaw has succeeded admirably in his task. There is little doubt that this book will become the standard textbook for those reading for the Teacher's Diploma, and a book of reference for the pupil midwife. The medical student may consult with benefit such chapters as those on "the

composition of the body fluids", "the cellular structure of the body", and "reproduction".

It is good to see manual removal of the placenta advocated for the midwife in the treatment of continuous postpartum haemorrhage when simpler methods have failed and medical aid is not to hand But why the aversion to ergometrine?

In the closing chapter of the book there is much food for thought for both midwife and doctor about their relationship and several responsibilities, and no better time than the present could have been chosen to discuss these. Not only is the harmony of the midwife-doctor relationship important but the heavy responsibility of State to each is paramount.

G. GORDON LENNON

### REPORTS OF SOCIETIES

### EDINBURGH OBSTETRICAL SOCIETY

AT a meeting of the Edinburgh Obstetrical Society on 19th May, 1948, the President, Dr. W. F. T. Haultain, in the Chair, a paper was presented by Mr. Charles Read entitled THE ROLE OF SURGERY IN THE TREATMENT OF CARCINOMA OF THE CERVIX.

Mr. Read said that division of opinion centred around the relative merits of radiation and radical surgery in Stage I and Stage II cases. There was little debate in respect of Stage III and Stage IV cases, which were generally unsuitable for surgery. While in many clinics the Wertheim operation had been abandoned when radiotherapy had been generally established, at the Chelsea Hospital for Women this operation had been performed continuously since Mr. Bonney introduced it in 1907, although it had been the practice latterly rather carefully to select the cases. From the published statistics, even the surgical enthusiast must admit that the results of radiotherapy compared favourably with those of surgery; but the question might well be raised whether any of the fatalities after radiotherapy might be avoided by judicious surgical procedures. Mr. Read suggested that there were 7 indications for a surgical attack upon cervical carcinoma, namely

- Radio-resistant growths proved either clinically or cytologically.
- (2) Columnar celled carcinoma of the cervix.
- (3) Vaginal vault stenosis.
- (4) The presence of large fibroids or ovarian cysts complicating the growth.
- (5) Salpingitis with cervical cancer.
- (6) Refusal of radiation by the patient.
- (7) Pregnancy complicating cervical carcinoma.

After discussing each of these indications separately, Mr. Read dealt with the Wertheim operation after previous irradiation. Although this did increase technical difficulties, the operation in proved radio-resistant cases was justifiable, experience in the Chelsea Hospital showing a

5-year survival rate of 44.4 per cent in 34 Stage I and 20 Stage II growths.

Regarding iliac lymphadenectomy, from material obtained at the Wertheim operation, from autopsy material, and from that obtained at the operation of lymphadenectomy without removal of the uterus, Mr. Read had come to the conclusion that the rate of gland involvement was approximately

Stage I—20-25 per cent Stage II—30-35 per cent Stage III—40-50 per cent Stage IV—Over 60 per cent

From these it would appear that treatment by radium alone, using vaginal applicators only, could never hope to give adequate radiation to the lymphatic field. It therefore seemed that there was a place for iliac lymphadenectomy in Stage III cases which had been cured locally by radium, and that such a procedure could well be extended to include Stage II cases and selected cases of Stage I growth.

Mr. Read discussed the technique of the Wertheim operation with particular reference to the carrying out of lymphadenectomy early in the operation, leaving the iliac and obturator lymph node chain attached to the uterus throughout, to the need to remove at least the upper half of the vagina, and to the use of plasma or blood transfusion. He recorded an incidence of postoperative urinary fistulae of 3.1 per cent.

In discussion Professor Robert McWhirter said he found comparatively few points of divergence of opinion between Mr. Read and himself. At one time there had been sharp differences between surgeons and radiologists, but increasing experience had narrowed the area of disagreement very considerably, and further study might yet obliterate it. His own opinions were governed not only by technical matters of detail but also by certain general principles of approach. Of these he placed first the need to consider each case of cancer individually, and to treat the patient and not the tumour. The prime object should be to make her

more comfortable and any treatment which cured the cancer without achieving this end was a failure.

The maximum distance from the cervical canal at which radium might be expected to be effective was 3 cm. Growths which extended beyond that distance were insusceptible to radium. The tumour lethal dose varied in different tumours and some might justifiably be described as radio-resistant, but the most important limiting factor in regard to treatment was the restricted striking distance of radium. Radio-sensitivity of tumours was a variable factor. At the moment the opinion of the histologist was of limited value in its recognition, and a new approach to its histological study was necessary. Possibly the observation of the irradiation effects in successive biopsies might prove a valuable field of investigation. It was difficult to envisage any great increase in radium range in the near future, apart possibly from improved applicators, with more efficient screening of the bladder and rectum. It was the need to avoid damage to these organs which chiefly restricted the dosage.

When supplementing the radium treatment with X-rays was first attempted, the whole pelvis was irradiated; and not uncommonly necrosis developed in tissues which had already received a high dosage from radium. It became obvious that if X-ray treatment was to be really beneficial, it must be closely aligned to the radium treatment. Patients with cells just outside the effective range of radium were far more likely to benefit from X-rays than patients with cells far out in the pelvis, for these latter advanced cases frequently had distant metastases as well. In order to try to align the 2 methods of treatment, the X-ray fields were planned from the radiographs showing the position of the radium in the uterus, but when vaginal packing was introduced the uterus might be greatly displaced to one or other side of the pelvis and might be displaced upward to a considerable extent. These difficulties could to some extent be overcome by the use of special radium applicators, such as those devised by Richards of Toronto. X-ray

therapy alone would remain an unsuitable method of treatment until much more powerful apparatus became available.

Professor McWhirter believed that surgery was the most effective method of treating cancer when it was early and localized. Unfortunately, by the time patients sought advice, the disease was often no longer suitable for treatment by surgery. In criticism of some of the claims for surgical treatment, it must be pointed out that a number of factors operated to produce a favourable selection of cases. For example, the patients submitted to surgery were usually in good condition, not unduly obese and not too old, and restricted to Stage I and early Stage II cases. Because extensive lymphadenectomy must always remain a piecemeal dissection, he thought it unlikely that this practice would greatly improve the eventual prognosis.

He did not believe that an inoperable case could ever be rendered operable by preliminary irradiation, although he believed improvement might be obtained by means of postoperative irradiation with very high voltage X-ray apparatus, and preoperative irradiation in operable cases might be of benefit.

In a review made some time ago, the 5-year survival rate in Edinburgh was 29 per cent of all cases referred. In the most recently analysed cases, the 5-year survival rate was 34 per cent. In the calculation of these survival rates, no case was omitted from the total for any reason whatsoever. He believed that these figures might be improved by the use of surgery where the disease was early and where the tumour was shown to be radio-resistant, and he thought a serious attempt should be made by histologists to recognize resistant tumours, so that the appropriate treatment might be given initially.

The paper was discussed further by Dr. Douglas Miller, Dr. E. C. Fahmy, Dr. Clifford Kennedy, Dr. J. C. Clark, Professor Margaret Fairlie, Dr. R. de Soldenhoff and Professor R. J. Kellar. The President summed up.

### REVIEW OF CURRENT LITERATURE

The Journal is fortunate in being able to run this Review in conjunction with the Abstracting Service of the British Medical Association. All the abstracts of this service which cover obstetrical and gynaecological literature and literature on the new-born are at our disposal. The Review will, however, contain in addition abstracts and titles of articles which, though not of sufficient general interest for publication in the monthly volumes published by the British Medical Association, are yet sufficiently important for a specialist journal. It is to be hoped that our readers will collaborate in the preparation of these abstracts. Those who are willing to take part in the service are invited to communicate with the Editor, The Abstracting Service, B.M.A. House, Tavistock Square, London, W.C.I. There is special need of abstracters in foreign languages, and when offering his or her services the writer should indicate the language (apart from English) in which he or she is proficient. The name of the abstracter will be acknowledged in the text and payment will be made at the rate of ten shillings per abstract for English articles and twelve shillings and sixpence per abstract for articles from foreign languages.

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### **ANATOMY**

1412. Pelvic Mensuration: A Study in the Perpetuation of Error.

By N. J. EASTMAN. Obstet. gynec. Surv., 3, 301-329, June 1948. 19 figs., 20 refs.

1413. Roentgen Pelvimetry.

By E. G. REUTER. Texas J. Med., 43, 762-764, Apr. 1948. 1 fig.

1414. Clinical Interpretation of X-ray Pelvimetry. By H. P. Taylor. Ohio St. med. J., 44, 608-611, June 1948. 7 refs.

1415. A New Technique for Radiopelvimetry (Magnin's Apparatus). (Un nouveau procédé de radiopelvimétrie (Appareil de Magnin).)

By E. P. NAUDIN. J. Radiol. Electrol, 29, 254-

256, 1948. 5 figs.

1416. Histological Data on the Changes in the Endometrial Vessels of Hypertensive Women. (Documents histologiques sur les modifications des vaisseaux de l'endomètre de femmes hypertendues.)

By J. Bret and B. Duperrat. Gynéc. et Obstét., 47, 349-358, 1948. 8 figs.

1417. The Detailed Anatomy of the Paraurethral Ducts in the Adult Human Female.

By J. W. HUFFMAN. Amer. J. Obstet. Gynec.,

55, 86-101, Jan. 1948. 10 figs., 31 refs.

The detailed anatomy of the paraurethral ducts and glands in the human female is a controversial subject. After reviewing the literature of the subject briefly but comprehensively the author describes his own findings in several adult human

female subjects.

His method of study was by wax-model reconstructions. His material was obtained from II necropsies. From each a mass of tissue was excised. This contained the entire wrethra and the surrounding structures lying beneath the pubic arch, the lower portion of the bladder, and the anterior vaginal wall. After fixation each mass was cut to a size suitable for histological preparation. When so trimmed, each block consisted of the urethra, the periurethral tissues, and the intact suburethral vaginal mucosa. These blocks were then cut transversely into several serial blocks, and subsequently each block was serially sectioned at 10 micra. Every twenty-fifth section was stained with haematoxylin and eosin. When wax models were to be made these sections were placed under a projecting microscope and enlarged. The enlarged images were transferred on to paper; the outlines of the desired structures were traced, and they were transferred from the paper on to wax plates whose thickness was such as to maintain correct longitudinal proportions. The serial waxed plates were subsequently annealed to form models.

The most striking feature of this study is the

great extent of the tubules and epithelial-lined pockets which lie about the adult human female urethra. It is popularly considered that this homologue of the prostate is at best a scattering of insignificant tubules or evaginations of the urethra with 2 or occasionally 3 major ducts opening at the urethral orifice and extending laterally and dorsally in the urethral walls. Instead, the prostatic homologue is found most often to be a widespread branching of ductal channels and glands surrounding the female urethra to some extent on all sides, but mostly laterally and posteriorly. The smallest number of ducts found in any specimen was 6 and the largest 31. The glands are branched tubular glands with straight or slightly curved branches which empty into the ducts which in turn open mainly into the distal third of the urethra. The glands are lined with columnar epithelium, which has some secretory activity. The part which the paraurethral ducts may play in the aetiology of lesions of the urethra and anterior vaginal wall is discussed... Anthony W. Purdie

1418. Study of Ureteral Blood Supply and its Bearing on Necrosis of the Ureter Following the Wertheim Operation.

By J. P. MICHAELS. Surg. Gynec. Obstet., 86 36-44, Jan. 1948. 2 figs., 55 refs.

The reasons for the gradual return to radical surgery for the treatment of carcinoma of the cervix are outlined—unsatisfactory results of irradiation alone, improved surgical and anaesthetic technique, greater use of blood transfusion, and the advent of chemotherapy. Ureteric fistula is, in the opinion of the author, a major risk associated with the radical surgical technique. Fistulae result from division or crushing of the ureter at the time of operation and also from necrosis due to damage to the blood supply. This damage may involve the periureteric vascular plexus or the main arteries supplying it. To study the blood supply of the ureter the author perfused and injected 8 recently stillborn foetuses with coloured synthetic liquid latex. He found that the chief vessels are "long" arteries arising from one or more of the following vessels: the abdominal aorta adjacent to its bifurcation, the common iliac artery, and the hypogastric artery. These long arteries on reaching the ureter divide into ascending and descending branches, which supply the periureteric plexus and anastomose with vessels from the renal, ovarian, uterine, and vaginal vessels. The smaller vessels arising from these main ones ramify over the surface of the ureter and send branches which pierce its muscular wall. Damage to the blood supply may follow: (1) injury to the long arteries; (2) the formation of exudates and haematomas; (3) vasospasm. This latter may be avoided by resection of the hypogastric plexus during the operation. J. Stallworthy

### **PHYSIOLOGY**

1419. The Physiological and Pathological Functions of the Ovaries. (O prawidlowej i patologicznej czynności jajnika.)

By H. GROMADZKI. Przeg. Lek., 3, 791-799,

Dec. 1947. 24 refs.

1420. The Influence of Thyroid Activity on the Function of the Ovaries. (Z badan nad wplywem hormonów tarczycy na czynność jajników.)

By W. PAWIK. Przeg. Lek., 4, 23-24, Jan. 1948. The author discusses, in the light of various recent clinical and experimental investigations, the relation between the thyroid gland and the ovary. His own experiments were made in order to find out what changes are caused in the function of the ovary in white mice by lack of thyroxine. Injections of an aqueous solution of methylthiouracil were used to stop the production of thyroxine. The mice were divided into 6 groups according to the daily dosage of methylthiouracil, which varied from 0.0005 g. to 0.05 g. The oestrus cycles were investigated by means of vaginal smears. Prolongation of dioestrus was observed after 3 to 4 cycles and in some of the animals oestrus was also prolonged. Oestrus ceased entirely 40 to 50 days after the start of the injections. Biopsy of the ovaries of those mice which had been injected for 90 to 150 days revealed congestion, ecchymoses, and the presence of many atretic follicles but no mature follicles. After 90 to 120 days of these injections some of the mice were divided into 2 groups; in one the injections of methylthiouracil were continued, in the other they were stopped. Both groups were put with males of the species. After 6 weeks the mice which had not received injections became pregnant at varying times. The pregnancy and the subsequent litter were normal. The other group remained sterile. The author compares the result of his own experiments with the investigations carried out by others. Insufficient production of gonadotrophin, when the production of thyroxine is stopped, is generally supposed to be the cause of the changes in the C. Uhma

1421. The Vaginal Cycle of Elderly Women as a Biological Test of Functional Activity of an Oestrogenic Hormone. [In Russian.]

By I. D. Arist. Akush. Ginek., No. 2, 7-9, 1948.

1422. Estrogens in Urine and Cytology of Vaginal Smears after the use of an Estrogenic Cream.

By J. EIDELSBERG. Amer. J. med. Sci., 214,

630-632, Dec. 1947. 6 refs.

The fluctuations in estrogen excretion in 4 untreated controls and in 14 patients, before and during the use of an estrogen cream by facial inunction were similar in pattern and not significantly different in amount. Likewise, their vaginal smears appeared to show no significant alteration

in cytological cycles. Therefore, in the amounts and by the method applied (3,750 i.u. per week, or +535 i.u. daily) the estrogen cream does not appear to produce any systemic effect.—[Author's summary.]

1423. The Excretion of Sex Hormones after Hysterectomy.

By M. L. TSYRULNIKOV. Akush. Ginek., No. 5,

40-46, 1947.

An investigation into the ovarian function of 51 women who had undergone hysterectomy was carried out by estimating urinary excretion of oestrogens and gonadotrophic hormones—18 (35.3) per cent) were found to excrete both oestrogens and gonadotrophic hormone; 5 (9.8 per cent) were found to excrete only oestrogens; 23 (45.1 per cent) were found to excrete only gonadotrophic hormones; and 5 (9.8 per cent) were found to excrete no hormones at all. The author considers that excretion of both oestrogens and gonadotrophic hormones indicates normal activity of the ovaries, while excretion of only oestrogens indicates the beginning of failure of ovarian function, and excretion of gonadotrophic hormone alone or of no hormones at all indicates cessation of ovarian activity (and in the last type cessation of pituitary activity as well). A careful analysis of the cases shows that excretion of the hormones depends on the age at the time of the hysterectomy, on the type of hysterectomy carried out, on the amount of ovarian tissue left, and on the time elapsed since hysterectomy. activity persisted in 47.4 per cent of cases when hysterectomy was performed before the age of 35, but in only 28.1 per cent of cases when hysterectomy was performed after the age of 35. Subtotal hysterectomy seems to be the optimum operative procedure, and the removal of one ovary appears to influence adversely the persistence of ovarian function. In 60 per cent of cases ovarian function was still present up to 3 years after the operation; beyond the period of 3 years, ovarian function was present in 22.7 per cent of women who were under 35 at the time of hysterectomy, but in only 9.1 per cent of women who were over 35 at the time of hysterectomy. Menopausal symptoms after hysterectomy did not entirely coincide with absence of excretion of the sex hormones.

Nicolas Tereshchenko

1424. Muscular Activity of the Fallopian Tube in Different Phases of the Menstrual Cycle, in Pregnancy, and at the Menopause.

By A. I. Rozhdestvenskaya-Osyakina. Ahush.

Ginek., No. 5, 31-36, 1947.

Four types of experiment were carried out on 140 human Fallopian tubes removed at operation: (1) Observation of spontaneous contractions of the Fallopian tube and its reaction to stimulation (100 experiments). (2) Observation of the flow of coloured water under pressure through the Fallopian tube in the direction from ampulla to uterus and

in the opposite direction (87 experiments). (3) Kymographic recording of the contractions of whole Fallopian tube and of segments of Fallopian tube (203 experiments). (4) Observation of the movement of foreign bodies (actually poppy seeds) introduced into the ampullary end of Fallopian tubes, and recording of the resulting muscular activity (30 experiments). Five series of subjects were chosen: (a) Fallopian tubes of women in the first half of a menstrual cycle (15 cases); (b) Fallopian tubes of women in the second half of a menstrual cycle (20 cases); (c) Fallopian tubes of women in the menopause (6 cases); (d) Fallopian tubes of women during normal pregnancies (26 cases); (e) Fallopian tubes of women with tubal pregnancies (11 cases). In all cases the muscular activity of the ampullary part of the Fallopian tube was found to be the same, and resembled the pendulum-movement type of activity seen in small intestine. The muscular activity of the other parts of the Fallopian tube was found to vary with its physiological state, and can be classified into 3 types: (1) Very irritable tube, responding readily to slightest stimulation, contractions spasmodic, no peristalsis, no rhythmical or periodic contractions, toreign body tightly gripped but not passed along lumen. Water flows as a thin continuous stream at a pressure of 20 to 25 cm. except during spasmodic contractions, when the flow stops and may not restart for I to 2 hours unless the pressure is raised by 5 to 8 cm.; this type of muscular activity occurs during the first half of the menstrual cycle. (2) Tube not irritable and not responding readily to stimuli, contractions peristaltic and rhythmical periodic shortening, foreign body passed along lumen towards uterus. Water flows in intermittent jets at a pressure of 6 to 12 cm.; this type of muscular activity occurs during the second half of the menstrual cycle and during pregnancy. (3) Tube not irritable, not responding to stimulation, no contractions, foreign body evoking no response and remaining stationary. Water flows as it would through a rubber tube of the same diameter; this type of muscular activity occurs after the menopause. The author concludes that the hormonal influences during the first half of the menstrual cycle help to place the Fallopian tube in a position and state favourable for the reception and retention of the maturing ovum, while during the second half of the menstrual cycle and in pregnancy rhythmical muscular activity with lowered tone and excitability occur and thus favour fertilization, implantation, and gestation. Thus a change in the relative proportions of folliculin and lutein may be a factor in the causation of ectopic gestation and Nicolas Tereshchenko sterility.

1425. Physiology of Menstruation. (Fisiología de la menstruación.)

By J. B. Llusia. Toko-ginec. Práct., 7, 181-254, May 1948. 14 figs.

1426. Influence of Menstruation on the General Health. (Beeinflussung des Allgemeinbefindens durch die Uterussunktion (Menstruation).)

By H. Kustner. Zbl. Gynäk., 69, 1085-1087, 947.

1427. Morphological Basis for Menstrual Bleeding. Relation of Regression to the Initiation of Bleeding. By J. E. MARKEE. Bull. N.Y. Acad. Med., 24, 253-268, Apr. 1948. 8 figs., 14 refs.

1428. Methods of Determining the Time of Ovulation.

By E. M. JACOBS. J. Bowman Gray Sch. Med., 6, 56-61, Apr. 1948. 30 refs.

1429. Adaptation of the Spiral Artery in the Rabbit Ovary to Changes in Organ-size After Stimulation by Gonadotrophins: Effect of Ovulation and Luteinization.

By S. R. M. REYNOLDS. Endocrinology, 40, 381-

387, June 1947. 9 figs., 6 refs.

The arterial supply of the rabbit ovary was visualized by injecting vinylite plastic and digesting the tissue away. The two spiral arteries in the normal rabbit ovary have already been described by Reynolds (Amer. J. Obstet. Gynec., 1947, 53, 221). When gonadotrophin injections produced ovulation and luteinization there was a "paying-out" of the coils so that the arteries were lengthened and appeared sinuous instead of spiral. Coils became flattened and oblique instead of perpendicular to the ovarian surface. These changes were present for the first 3 days after the injection and the normal state was restored after 6 to 9 days.

[The findings indicate the use of the spiral arrangement in allowing the blood supply to keep pace with rapid increases in tissue volume.]

Peter C. Williams

1430. Relation between Time of Fertilization and Follicle Cell Dispersal in Rat Ova.

By S. L. LEONARD, P. L. PERLMAN, and R. KURZROK. Proc. Soc. exp. Biol., N.Y., 66, 517-

518, Dec. 1947. 5 refs.

Since the discovery that the enzyme hyaluronidase from sperm disperses the follicle cells of recently ovulated mammalian ova, a concept has arisen that the action of this enzyme facilitates fertilization by denuding the ova before, or simultaneously with, sperm entry. Complete cell dispersal may be seen when mammalian ova are denuded by hyaluronidase in vitro, but observations reported in the present paper indicate no mass removal of follicle cells before fertilization and that sperm penetration precedes the gross denudation of the ovum in the rat. Fertilized ova were recovered from the oviducts of rats in this experiment and examined microscopically before and after hyaluronidase was introduced into each horn of the uterus of a rat in oestrus, the horns being ligated , near the cervix to prevent leakage; ova were

recovered 18 to 24 hours later. The results indicate that sperm make their way between the follicle cells and fertilize the ovum before any visible dispersal of follicle cells occurs. Somewhat later the follicle cells are dispersed, freeing the ova. Most of the sperm and hyaluronidase remain in the uterus after copulation, and mass movement of the enzyme from the uterus into the tubes does not seem to play a part in the process of denudation and fertilization. The authors consider that hyaluronidase is produced by those sperm which gain access to the tubes, and that, with the aid of this enzyme, the sperm traverse the follicle cell mass to fertilize the ovum. The later concentration of enzyme is sufficient to denude the ova; this was observed 24 Doreen Daley hours after coitus.

1431. An Improved Method of Extraction and Purification of Relaxin from Fresh Whole Ovaries of the Sow.

By A. Albert, W. L. Money, and M. X. Zarrow. *Endocrinology*, 40, 370-374, June 1947. 4 refs.

Dilute hydrochloric acid (2 per cent) extracts 200 to 300 times more relaxin from fresh ovaries of the sow than had previously been extracted from separated corpora lutea. Relaxin activity was present equally in the corpora lutea and the rest of the ovarian tissue, but not in the follicular fluid. The higher yields are attributed to the fact that ovaries from pregnant sows were used; when such ovaries were extracted they yielded 3,200 to 9,600 units per g., while only 3 to 10 units per g. were obtained from the ovaries of non-pregnant sows. This big difference affords evidence that relaxin plays some part in pregnancy in animals in which no relaxation of pelvic ligaments takes place at parturition.] A purification process based on acid extraction, absorption on "bentonite", and isoelectric precipitation is described. It yielded a final product containing 300 units per mg., which is about 10 times purer than the purest previous Peter C. Williams extract.

1432. A Rapid Method for the Estimation of Pregnancediol.

By J. RABINOVITCH. *Nature*, *Lond.*, 161, 605, Apr. 17, 1948.

1433. Metabolism of Synthetic Oestrogens in Man. By A. E. WILDER SMITH. Nature, Lond., 160,

787, Dec. 6, 1947. 4 refs.

Over-dosage with synthetic oestrogens may alter the path of their excretion by allowing unchanged phenol to be excreted. Thus the metabolism of stilboestrol cannot be conveniently studied by determinations of ethereal sulphate or glucuronic acid. To control experiments on man and animals chemical separation methods checked by bio-assay have been devised (Sahasrabudhe and Wilder Smith, Biochem. J., 1947, 41, 190). Early results show that less than 1 per cent oestrogen is excreted in the free form.

Magnus Haines

### PREGNANCY

1434. Temperature Measurements in Mother and Foetus. (Temperaturmessungen bei Mutter und Frucht.)

By W. BICKENBACH and B. ROEVER. Zbl.

Gynäk., 69, 151-159, 1947. 7 refs.

These authors, with the aid of specially temperature-recording constructed measured the temperature in the abdominal cavity, in the uterine muscle, in the uterine cavity, and in the mouth and/or anus of the foetus while it was still in the uterine cavity. These measurements showed that the foetal temperature was on an average 0.7°C. higher than that of the uterine cavity and this was on an average 0.3°C. higher than that of the uterine muscle. The temperature of the uterine muscle was the same as the rectal temperature before the start of an abdominal operation. The rectal temperature during an abdominal operation fell in the course of 45 to 55 minutes by about 0.4°C., but there was no alteration in temperature of the uterine muscle during the whole operation. Gladys Dodds

1435. The Primigravida over 40. (Die erste Geburt 1m 5.Lebensdezennium.)

By P. SALACZ. Zbl. Gynäk., 69, 988-995, 1947. 16 refs.

1436. Weight Changes in Pregnancy.

By C. L. Spurling. J. Bowman Gray Sch. Med., 6, 65-69, Apr. 1948. 19 refs.

1437. Studies of Haematology in Pregnancy. I. The Bone Marrow in Normal Pregnancy. (Estudios sobre hematología de la gestación. I. La medula ósea en la gestación normal.)

By M. Montoya Gomez. Clin. y Lab., 44, 170-

177, Sept. 1947. 9 figs., 11 refs.

The sternal bone marrow in 150 cases of normal pregnancy and in 50 cases of toxaemia and infection following abortion has been studied. The cases of normal pregnancy were divided into 4 groups:

(1) and (2) those in the first and second trimesters;
(3) those in the seventh and eighth months which, because of special features of the reaction in late pregnancy, were grouped together and separated from (4) those in the ninth month. Of 400 cells counted, 20.1 per cent belonged to the red-cell series in the first trimester, 21.65 per cent in the second trimester, 25.8 per cent in the seventh and eighth months, and 25.05 per cent in the ninth month. These figures are compared with the level of 18 per cent found in normal individuals by Rohr.

In 75 to 80 per cent of cases the perforation of the bone and aspiration of medulla were unusually easy, as a result of the softening of the bone by increased medullary function, while in 10 per cent there was increased resistance. The erythroblastic reaction is definite in the first trimester, when collections of normoblasts not usually found in non-pregnant patients can be seen. In the second trimester collections of reticulated plasma cells have often been observed when there is an erythroblastic reaction, a finding which does not seem to have been noted by other authors. The erythroblastic reaction is most marked in the seventh and eighth months, in spite of a fall in the number of circulating red cells. A normoblastic type of reaction has always been found, and in no case have megaloblasts been seen. The author does not believe that megaloblasts and normoblasts can be produced together, and considers that the megaloblasts reported by Daniachij were really procrythroblasts.

Bryan Williams

1438. The Main Factors in Erythrocyte Sedimentation during Pregnancy and after Normal and Pathological Labour. (Les principaux facteurs de la sédimentation sanguine au cours de la grossesse et dans les suites de couches normales et pathologiques.)

By J. BADIN and G. CONAS. Rev. Hémat., 2,

296-304, 1947. 2 figs., 11 refs.

From the second or third month of pregnancy erythrocyte sedimentation rate (E.S.R.) increases, reaching its maximum at term. The factors responsible for this acceleration are said to be: (1) a considerable increase in the amount of plasma relative to increase in the level of fibringen; (2) a qualitative change in fibrinogen; (3) a progressive increase in the "serum factor"; (4) a decrease in the number of erythrocytes. Normally, within 10 days of delivery the E.S.R. has returned to the level found between the fourth and sixth months of pregnancy. Infective complicationssuch as phlebitis or endometritis-cause great increase in the E.S.R., said to be due to increase in the serum factor, moderate increase in the plasma factor, and decrease in the number of erythrocytes. The authors reiterate the accepted teaching that such changes give an excellent indication of postpartum complications even before these are clinically evident. They point out that it is well known that the E.S.R. is accelerated after severe haemorrhage, but state that the determining factors are different, being, in order of importance, decrease in the number of corpuscles, increase in the plasma factor, and, of least importance, increase in the serum factor.

[This paper would seem to be one of the now numerous attempts to determine the bases of the erythrocyte sedimentation test, a praiseworthy aim, but one which, unfortunately, has led to continuous complication of what was originally a simple, but nevertheless valuable, test.]

A. Piney

1439. Behaviour of Single Fractions of Unsaturated Fatty Acids in the Blood Serum in Pregnancy. (Sulcomportamento delle singole frazioni degli acidi grassi insaturi nel siero della gravida.)

By G. Micale. Riv. ital. Ginec., 30, 36-48, 1947.

18 refs.

Applying the method of Allegra for determination of some fractions of unsaturated fatty acids the author has studied the behaviour of the oleic acid, linoleic acid, linolenic acid, and isolinolenic acid fractions in the blood serum of healthy pregnant women during the ninth month of pregnancy. As controls healthy non-pregnant women between 20 and 40 years of age were used. The blood samples were taken in the morning from fasting patients. The method is described in detail, and the results are tabulated. The values obtained revealed a constant increase in the fractions of unsaturated acids examined, more particularly in the oleic acid fraction.

Three possible hypotheses are considered. A foetal origin of the maternal unsaturated fatty acids is improbable. The increase in unsaturated acids cannot be due to an accumulation of the so-called vitamin F, since it involves not only those acids (linoleic and linolenic) to which a vitamin action has been assigned by Evans, but also the oleic acid. It is more probable that the increase is due to a deviation of the normal lipid metabolism. The author considers the possibility that the hyperlipaemia due to mobilization of the stored fats during pregnancy is preceded by a process of unsaturation of the fatty acids. Rina Saunders

1.440. Haemoconcentration in Obstetrics. (La hemoconcentración en obstetricia.)

By L. T. BROUSSE and O. T. ROCCHI. Bol. Soc. chil. Obstet. Ginec., 12, 302-310, Dec. 1947.

1441. Haptoglobin in Obstetrics. (Haptoglobin v porodnictive.)

By E. Dinos. Ceskoslov. Gynaek., 13, 223-233,

1442. Liver Function Tests in Pregnancy. (Epreuves fonctionnelles et foie de grossesse.)

By D. STUCKI. Schweiz. med. Wschr., 78, 487-491, May 22, 1948. 1 fig., 13 refs.

1443. Tyrosine Tolerance Test in Pregnancy and the Puerperium.

By E. W. Page. Proc. Soc. exp. Biol., N.Y.,

66, 79-82, Oct. 1947. 2 figs., 7 refs.

Subjects employed for investigation of the tyrosine tolerance test included 8 women in normal pregnancy of 7 to 9 months' duration, 1 patient with eclampsia, and I with severe pre-eclampsia; 7 other women were studied from 1 to 36 hours after normal delivery. Ten control subjects of similar ages were selected. The fasting patient was given 4 g. of tyrosine in casein solution. Blood samples at two 45-minute intervals were examined by the method of Bernhart and Schneider (Amer. J. med. Sci. 1943, 205, 636). In half the subjects of the normal non-pregnant and pregnant groups, urine samples were collected for 8 hours before and 8 hours after tyrosine administration. The samples were analysed for tyrosyl compounds (Medes, Biochem J., 1932, 26, 917). In this small series a

reduced tyrosine tolerance was found during pregnancy, but this condition was reversed after delivery. No changes in tolerance were noted in pre-eclampsia or eclampsia. It is thought that the observed shifts in tyrosine metabolism might invalidate the test as an indication of liver function in pregnancy and the puerperium.

Magnus Haines

1444. Nucleolar Substance in the Anterior Lobe of the Human Pituitary Gland.

By C. CAVALLERO. Arch. Path., 44, 639-645,

Dec. 1947. 1 fig., 16 refs.

Large acidophil vesicles, possibly nucleoli, were found in the nuclei of chromophobe, eosinophil, and pregnancy cells, and in a few degranulated basophil cells of the anterior lobe of the pituitary body, most commonly in the marginal and posterior portions. The cells containing these vesicles varied in size from 10 to  $35\mu$ , with irregular nuclei most commonly of 15 to  $22\mu$ . The vesicles varied in size from 10 to 2011; when they were small in relation to the nuclei containing them the chromatin of the latter was reticular, but when they were large the chromatin was condensed. The vesicles were not stained with specific stains for mucin, iron, fat, or lipids.

The vesicles were present in 34 per cent of 404 pituitary glands studied, and ranged in number from 1 to 5 per section; occasionally 5 to 10 and rarely 50 to 120 vesicles were found in a section. They are absent before puberty and most frequent between the ages of 20 and 40 years in both sexes. They were found in all patients during pregnancy and the puerperium, in female castrates, hypogonadic males, and in patients with gynaecomastia, adreno-genital syndrome, and Addison's disease. They were present in variable proportions of patients with a variety of diseases. Among nonendocrine diseases, the endonuclear vesicles are commonest in intracranial tumours, neoplasms, and leukaemia. It is suggested that the vesicles are giant nucleoli, concerned with a transfer of nuclear secretion to the cytoplasm. G. Discombe

1445. Significance of Changes in the Anterior Lobe of the Pituitary in Pregnancy. (Apropos du déterminisme et de la signification des modifications gravidiques de lobe antérieur de l'hypophyse.)

By L. Desclin. Brux-méd., 28, 1107-1112, May 30, 1948. 13 refs.

1446. A Simplified Method for the Quantitative Determinations on Free Pregnanediol Excretion in Pregnancy.

By M. E. Davis and N. W Firen Proc. Soc. exp. Biol. N.Y., 66, 39-42, Oct. 1947. 1 fig.,

Over 1,500 determinations of pregnanediol excretion have been carried out on a series of about 100 women attending the Chicago Lying-in Hospital.

The method is an adaption of that described by Guterman (J. clin. Endocrinol., 1945, 5, 407), 100 ml. urine, 50 ml. toluene, 10 ml. concentrated hydrochloric acid, and a few glass beads being placed in a 500-ml. flat-bottomed Florence flask. The contents are boiled vigorously under a reflux condenser for 15 minutes on an electric hot-plate. After cooling under tap water to room temperature, the contents are transferred to a 500-ml. separating funnel, the urine-acid layer is drawn off and shaken twice with 10- to 15-ml. volumes of fresh toluene; the toluene emulsion layer in the separating funnel is then washed twice with 15-ml. portions of 0.1 N sodium hydroxide; this is followed by two washings with 15-ml. portions of distilled water. The washed toluene and toluene-water emulsion layers are transferred to a 125-ml. Erlenmeyer flask. A few glass beads are added with toluene rinsings to the funnel. The mixture is boiled on an electric hot-plate under a hood. When the toluene is boiling smoothly and after the emulsion layer has disappeared, 10 ml. of freshly prepared 2 per cent sodium hydroxide in absolute methanol is added slowly. Boiling is continued until a granular precipitate is obtained and the solution has turned yellow or greenish yellow. The toluene mixture is then filtered through medium porosity fritted glass filters under slight suction. combined filtrates are evaporated on the hot-plate, an air stream being used to eliminate the last traces of toluene. To the residue is added 5 ml. of acetone. Solution is aided by gentle heat, and 20 ml. of o.r N sodium hydroxide is added slowly while the flask is still on the hot-plate. When the contents of the flask have boiled, the flask is placed in the refrigerator overnight. The resulting precipitate is collected by filtering through fritted glass and washed with the distilled-water rinsings. precipitate is then washed with 10 ml. petroleum ether. The receiving flask is changed and the precipitate dissolved by passing 10 ml. of hot absolute ethanol through the funnel. Any reddish yellowish discolouration of the precipitate necessitates re-precipitation by adding 40 ml. distilled water to the alcohol solution and heating to boiling. This step is repeated until the precipitate is white. The alcoholic filtrate is evaporated to dryness as above. To this 10 ml. sulphuric acid is added and the mixture allowed to stand for I The fully coloured solution may require dilution before readings are made in the spectrophotometer. The authors demonstrate the accuracy of their method by gravimetric comparisons.

Magnus Haines

1447. The Influence of Lowered Atmospheric Pressure on Pregnant Guinea-pigs. (Vliv snížehého tlaku vzduchu na tčhotna morcata.)

By J. Malek. Ceskoslov. Gynaek.. 12, 454-470, 1947. 2 figs., 11 refs.

Thirty-six pregnant and non-pregnant guinea-

pigs were exposed to low pressures corresponding to heights of 5,000 to 12,000 metres in a lowpressure chamber; 19 of them survived and gave birth to live animals, 11 of which were premature. Premature birth usually came on after 7 days. Six animals survived and had stillbirths. Five animals survived, each of which bore both live and dead litter. Six animals died, and it was found that the bigger the foetus the longer they survived a given pressure. Newborn animals were more resistant than both the foetus in utero and the pregnant adult animal. The author discusses the significance of his experiments for clinical medicine, with special reference to intrauterine asphyxia, the influence on pregnancy of sudden ascents to high altitudes, and the influence of climatic changes on pregnancy.

A. Rohan

1448. A Multi-channel Strain-gage Tokodynamometer: An Instrument for Studying Patterns of Uterine Contractions in Pregnant Women.

By S. R. M. REYNOLDS, O. O. HEARD, P. BRUNS, and L. M. HELLMAN. Bull. Johns Hopk. Hosp., 82, 446-469, Apr. 1948. 10 figs., 7 refs.

1449. Some Local Factors in Placental Growth. [In Russian.]

By E. N. Petrova. Akush. Ginek., No. 6, 23-26,

Beginning with a short account of an investigation into the biochemistry of "organizers" in amphibia, the author describes the results she obtained in a study of the metachromatic properties of human placental tissue. The results are based on the examination of 20 normal placentae (from 4 weeks to term) and of 3 abnormal placentae (2 cases of vesicular mole and I of chorionepithelioma). Metachromatic staining with toluidine blue of the stroma of the villi, just under the chorionic epithelium, is normally present in the first 3 months of pregnancy, and thereafter rapidly diminishes in extent, being absent at term. In hydatidiform degeneration and chorionepithelioma the amount of metachromatic tissue is significantly increased, and in chorionepithelioma the tissue is also present in the walls of the blood vessels supplying the Nicolas Tereshchenko growth.

1450. Possibility of Conception after the Bonney Amputation of the Cervix. (Die konzeptionsmoglichkeit nach der flachen Portioamputation nach Bonney.)

By A. L. Kroger. Zbl. Gynäk., 69, 1110-1115, 1947. 6 refs.

1451. The Friedman Test: A New Technique. (Reação de Friedman por nova técnica.)

By N. DE CASTRO BARBOSA. Rev. brasil. Med.,

4, 671-673, Sept. 1947.

Fifty ml. of fresh and filtered urine with 200 ml. of absolute ethyl alcohol is kept for at least half an hour at 37°C. The alcohol is then decanted and the sediment washed with approximately 5 volumes

of sulphuric ether. The ether is decanted and the sediment is dissolved in 10 ml. of normal saline containing 1 to 2 drops of glacial acetic acid. After evaporation of the remaining ether, the solution is ready for injection into the auricular marginal vein of the female rabbit. By the original method 10 ml. of urine was injected; by this new method five times the quantity of hormone is introduced into the organism of the rabbit, producing an earlier follicular haemorrhage-within 24 hours instead of 48-even less in sensitive rabbits. In addition, by climination of the fluid part of the urine, the risk of an immediate intoxication and death of the nabbit is avoided.

1 152. Urine vs. Blood Serum in Friedman's Test for Pregnancy.

By C. F. Kent. J. Missouri med. Ass., 45, 275, Apr. 1948.

1453. Early Diagnosis of Pregnancy by "Prostigmin" Injection. (La diagnosi precoce di gravidanza mediante iniezione di prostigmina.)

By M. Ferruzzi. Ginecologia, Torino, 14, 105-

120, Mar. 1948. 20 refs.

1454. The Rapid Rat Test for Pregnancy. The Ovarian Hyperemia Response as a Routine Diagnostic Procedure.

By G. M. RILEY, M. H. SMITH, and P. BROWN. J. clin. Endocrinol., 8, 233-243, Mar. 1948. 1 fig., 7 refs.

1455. Pregnancy Test using the Male Toad.

By C. Galli Mainini. J. clin. Endocrinol., 7,

653-658, Sept. 1947. 4 refs.

A new biological test for pregnancy is described from Buenos Aires. On a basis of the relation described by Houssay and Gonzalez (Rev. Soc. Argent. Biol., 1929, 5, 77) between the pituitary of the male toad, Bufo arenarum Hensel, and its testis, the authors inject 10 ml. of first morning urine, untreated, into the lateral lymph sac of the toad. Urine (1 or 2 drops) is taken by pipette from the urinary bladder of the toad and examined microscopically. The appearance of spermatozoa 3 hours after the injection is evidence of a positive reaction. [Although only just under 100 cases have been investigated the thesis is well presented, Friedman (rabbit) tests having been carried out in parallel.] The authors made a large series of control injections of urine (male, female, and children's) and of a variety of hormones. Consistent results were obtained in 94 out of 99 urines. Inconsistent results are not analysed. The series is admittedly small and observations were made only in the summer months. [Provided there is no variation in relation to the season of the year and that the species of toad were available in other countries the diagnostic value of this toad test might become Magnus Haines important.]

[See also Abstract 1456 for a description of the

findings in a larger series.—EDITOR.]

1456. The Galli Mainini Reaction. (Consideraciones sobre la reacción de Galli Mainini.)

By R. M. Pinto and H. J. Suer Boero. *Prensa méd. argent.*, 35, 165–168, Jan. 23, 1948. 2 figs., 27 refs.

The results of the Galli Mainini test carried out 441 times on the urine of 255 patients are reported. The male toad, Bufo arenarum Hensel, was used. The animals weighed over 100 g. and several tests were carried out on the same toad at intervals of at least 4 days, as spermatozoa have been found in the urine in the cloaca up to 68 hours after the injection of the specimen, and even up to 7 or 8 days. The test is best performed on the morning urine, and the injection is made into the dorsal lymphatic sac in the midline, the needle being passed through the fibrous median raphe until the skin of the caudal region can be raised. The urine is withdrawn from the cloaca of the toad with a fine pipette, care being taken to avoid directing the pipette too deeply or too far anteriorly and thus obtaining intestinal contents.

In 158 cases of pregnancy it was found that if 2 test animals were used the percentage of positive reactions in the first 5 months was 100; if a single animal only was used the percentage was as low as 90 in the third month. The percentage of positive reactions reached its lowest between the sixth and seventh months, corresponding with the level of gonadotrophins in the blood. During labour the figure fell to 50 per cent, and almost to nil 48 hours after delivery. When 10 ml. of urine was used there were 11.55 per cent of negative reactions, but with 20 ml. only 3.15 per cent. In 16 cases the Galli Mainini and Friedman tests were carried out. In 3 both reactions were positive and in 4 both were negative. In 7 the Galli Mainini reaction was positive and the Friedman negative, and in 2 the Galli Mainini reaction was negative and the Friedman positive; in all of these cases the clinical findings supported the findings in the Galli Mainini test. After the expulsion of a hydatidiform mole, the Galli Mainini reaction becomes negative more quickly than do the Friedman and Aschheim-Zondek reactions. The minimum amount of chorionic gonadotrophin capable of giving a positive reaction, which is stated by other authors to vary between 10 and 30 international units, was found to be in the region of 10 to 14 units.

In 20 patients with gynaecological complaints and 45 with amenorrhoea of different kinds the test was always negative. No false positive reactions were observed. A dose of 20 ml. gave a more intense and sensitive reaction than did 10 ml., but was well tolerated only by animals injected for the first time. There was no mortality with doses of 10 ml. In pregnancy a positive reaction was obtained after only 5 days of amenorrhoea. The authors believe the Galli Mainini test to be one of the best of the biological tests for pregnancy because of its sensitivity, the simple technique and ease of inter-

pretation, and because it renders early diagnosis possible. Bryan Williams

1457. The Galli Mainini Reaction in Diagnosis of Pregnancy. (Diagnostico biológico del embarazo por la reacción de Galli Mainini.)

By S. FUENZALIDA, F. LILLO, and C. AGUILAR. Bol. Soc. chil. Obstet. Ginec., 12, 277-280, Nov. 1947. 5 refs.

1458. Comparative Determinations of the Xenopus and Aschheim-Zondek Reactions. (Xenopustest und Aschheim-Zondek'sche Reaktion.)

By E. EICHENBERGER. Gynaecologia, Basel, 125, 337-347, June 1948. 3 figs., 22 refs.

1459. Diagnosis of Pregnancy with the Common, Frog (Rana esculeuta). (Diagnostico del embarazo con la rana comun.)

By J. Aznar-Ferreres. Laboratorio, Granada, 5, 535-537, June 1948.

1460. Colour Reaction of Pregnanediol and its Clinical Diagnostic Significance.

By A. P. PREOBRAZHENSKY and G. V. ORDINETS. Akush. Ginek., No. 6, 17-23, 1947.

After a brief review of the biochemistry of pregnanediol, the authors give a detailed account of the method of obtaining the colour reaction for pregnanediol. This reaction when positive is considered to afford fairly accurate confirmation of early pregnancy; as negative evidence this test is not so accurate as a negative Friedman or Aschheim-Zondek test. It is of value, however, in the prognosis of threatened abortion, and is a valuable and easy method of checking the effect of hormonal therapy in various menstrual abnormalities.

Nicolas Téreshchenko

1461. Diagnosis of Sex in Utero by Hormonal Methods. (Le diagnostic du sexe in utero à l'aide de méthodes hormonales.)

By I. BERTRAND and T. GAYET-HALLION. Ann. Endocrinol., Paris, 8, 534-539, 1947. 28 refs.

1462. Length of Human Gestation with Special Reference to Prematurity.

By M. N. KARN. Ann. Eugen., Camb. 14, 44-59, Oct. 1947. 4 figs., 25 refs.

From maternity hospital data the length of the human pregnancy (reckoned from the beginning of the last menstrual period) has been established as, on an average, 278 days, the standard deviation being 16.3 days; it has a wide range and includes about three times as many premature as postmature births. The author assumes tentatively that the non-Gaussian distribution based on the raw data is composed of three curves, one for abnormal prematurity, one for natural full-term pregnancy (a normal curve) with mean 280 days and standard deviation 11.3 days, and one for abnormal postmaturity. A birth weight of under 5½ lb. (2.49)

kg.), or 5½ lb. (2.38 kg.) for females, together with a period of pregnancy of under 260 days, should be taken as an index of prematurity. The length of pregnancy is the same for successive pregnancies and for male and female babies. H. Grüneberg

1463. Clinical Features and Treatment of Prolonged Pregnancy. (Klinik und Therapie der übertragenen Schwangerschaft.)

By H. Runge. Gerburtsh. u. Frauenheilh., 8, 401-408, May 1948. 8 refs.

1464. The Presumed Prolongation of Pregnancy. (La supuesta prolongación del embarazo.)

By E. U. RODRIGUEZ. Ginec. Obstet. Mexico, 3, 93-106, Mar.-Apr. 1948.

1465. Roentgenologic Methods in Obstetrics. By M. Schneider. *Texas J. Med.*, 43, 758-762, Apr. 1948. 8 figs., 7 refs.

1466. Radiology as it Relates to Obstetrics. By R. D. Moreton and T. F. Bunkley. Texas J. Med., 43, 753-758, Apr. 1948. 5 figs., 14 refs.

1467. Relation of Mothers' Diets to Status of their Infants at Birth and in Infancy.

By L. W. SONTAG and J. WINES. Amer. J. Obstet. Gynec., 54, 994-1003, Dec. 1947. 1 fig., 12 refs.

The authors investigated the relation of mothers' diets to the status of their infants at birth and in infancy. McLester in 1943 stated that lack of protein in the mother's diet, unless extreme, will not affect the development of the foetus, the tissues of the mother being broken down to provide the necessary amino-acids. Yet in 1944 Burke, Harding, and Stuart concluded, from a study of 216 women . and their children, that a significant relation was to be found between the protein content of the mother's diet during pregnancy and the length of her infant at birth. The authors' present study is based upon the observation of 205 mothers and their infants. These mothers, as a group, might be described as belonging to the upper middle class. Careful dietary records were obtained over considerable periods, and from these records quantitative analyses were made in terms of average intake of protein, calories, minerals, and the various The mothers were divided into five groups, according to their daily intake of protein, the particular groupings being so devised as to correspond to those used by Burke et al. Anthropometric measurements, including crown-heel · length, were made of all infants within 24 hours of their birth. As a result of these investigations the authors were unable to demonstrate unequivocally a relation between the mothers' diet and the length, weight, or ossification of their infants at birth or at 1 month, 6 months, and 12 months of age. They conclude that whilst maternal protein intake cannot be regarded as not having an effect upon the status of the infant at birth or during

the first year, it must fall below the levels used in these groupings before such an effect is clearly demonstrable. Variations in technique may account to some extent for the considerable differences in results of their studies and those of Burke et al.

Falkland L. Cary

1468. Nutrition in Pregnancy.

By H. SIMONNET. Canad. med. Ass. J., 58, 556-561, June 1948. 8 refs.

1469. Nutritional Requirements During Pregnancy and Lactation.

By B. S. Burke and H. C. STUART. *J. Amer. med. Ass.*, 137, 119-128, May 8, 1948. 1 fig., Bibliography.

1470. Proteins and Pregnancy.

By J. H. HANNAN. Med. Press, 219, 512-514, June 9, 1948. 6 refs.

1471. Toxemia of Pregnancy.

By S. T. GARBER and N. S. ASSALI, J. Indiana

med. Ass., 40, 979-985, Oct. 1947. 1 fig., 13 refs. The authors discuss the pathology and treatment of pre-eclampsia and eclampsia. The primary change is, they believe, vasoconstriction leading to ischaemia of the arteriolar and capillary wall with increased capillary permeability, oedema, and stasis, followed by damage to the endothelium and consequent thrombosis with or without haemorrhage, and finally, ischaemic necrosis in the area involved, the extent of the necrosis varying with the collateral circulation in the different organs. Intracranially, with the occurrence of increased pressure and vasospasm, there develop the classical signs of increased intracranial pressure—headache, vomiting, choked disk, convulsions, and coma. When a patient is seen for the first time late in pregnancy, observation of the eye grounds affords the best method of differentiating between hypertensive disease of long standing and pre-eclampsia. In the former the arterioles are constricted, tortuous, and of the silver-wire type, arterio-venous kinking is present, and the usual arterio-venous ratio of 2:3 is diminished to, for example, 1:2.

The following in outline is the therapy adopted: absolute rest in bed; forced fluids from 3,000 to 5,000 ml. daily; adequate protein intake; hypertonic glucose to promote absorption of oedema, secure diuresis, and supply glycogen to the liver; magnesium sulphate, intramuscularly to promote absorption of oedema, and by mouth to act as a saline cathartic. Magnesium sulphate is also given to decrease the irritability of the central nervous system. The authors do not employ sedatives, such as morphine, chloral, paraldehyde, barbiturates, to allay eclamptic convulsions because these only decrease the irritability of the nervous system and morphine inhibits the action of "veratrone"; the authors rely on veratrum viride "to reverse the vicious process initiated by vasoconstriction".

Termination of pregnancy may be necessary to save the woman from permanent vascular damage, and it is thought that the risk of this depends less on the height of the blood pressure than on the duration of the hypertension. Termination is preferably delayed till 35 weeks and carried out from below by induction of premature labour, Caesarean section is performed when the cervix is not prepared for induction or when some other indication for it exists. The foetal mortality in the authors' series of 1,310 toxic cases was 9.8 per cent and in 40 cases of eclampsia 27.5 per cent. There were 4 maternal deaths (0.3 per cent). In I case death was due to sepsis, in 2 to haemorrhage, and in I to eclampsia. Severe toxic separation of the placenta occurred in 17 cases with I maternal death. For prophylaxis of pre-eclampsia the authors advocate good prenatal care and hygiene; excessive gain in weight must be avoided, and rest is essential. Adequate fluid intake is necessary and, to prevent oedema, sodium in the form of salt and soda must be restricted in the latter half of preg-F. J. Browne

1472. Clinical and Statistical Findings in 214 Cases of Toxaemia of Pregnancy. (Rilievi clinico-statistici su 214 casi di tossiemia gravidica.)

By P. Alfieri. Ginecologia, Tormo, 13, 367-

390, Aug. 1947. 58 refs.

During the 10 years, 1934-43, there were 214 cases of toxaemia of pregnancy at the obstetrical and gynaecological clinic at Parma, representing 1.34 per cent of the pregnant women attending during this time. Of the total cases of toxaemia 55.6 per cent were seen in women aged 20 to 30, corresponding with the period of maximum fertility; primigravidae constituted 65.88 per cent of the patients. It was found that 35.5 per cent of the cases occurred in the spring and 26.5 per cent in the winter months - December, January, and February - while the lowest incidence was in In 54.2 per cent manifestations of autumn. toxaemia appeared for the first time in the last month of pregnancy, in 25.88 per cent in the eighth month. Albuminuria was present in every case. Hypertension, often reaching a high level, was found in the majority of cases.

During the second 5-year period, 29 per cent of patients were operated upon, compared with 32.14 per cent in the first 5-year period. Operative procedures, which were carried out with as little trauma as possible, included the use of Krause's bougies, extraction with forceps, or internal version. In the first 5-year period 5 mothers died, and necropsy revealed a degenerative lesion of the kidneys. In the second 5-year period only 1 patient died—of cerebral haemorrhage. Maternal mortality was 5.9 per cent in the first 5-year period and 3 per cent in the second; foetal mortality was 28.57 and 26.15 per cent in the two periods respectively. The author claims that the improvement in the second

5-year period may be attributable to a method of treatment in which glucose, insulin, and folliculin were employed. Eclampsia was treated by the method of Stroganoff in the first 5-year period, while in the second "pernocton" and sodium dehydrocholate were used. The author believes that treatment with hormones, especially folliculin, is of value, and suggests that toxaemia may be a result of hormonal imbalance in the mother, caused by the secretions of the chorionic tissue.

[The diagnosis of toxaemia in this series of cases appears to have been made solely on the occurrence of albuminuria. It seems that blood pressure was not recorded until albuminuria had appeared. This makes the results hardly comparable with those from Britain, where, on the whole, the importance of a rise in blood pressure as an early sign of toxaemia is appreciated. The statistical evidence in this article does not appear to be adequate to prove that the newer methods of treatment employed were effective.]

Josephine Barnes

1473. Aetiology of Toxaemia of Pregnancy. (Graviditetstoxemiens etiologi.)

By A. EDLEN, B. KNUTSSON, and K. PALM-STIERNA. Nord. Med., 36, 2281-2285, Nov. 14,

1947. 7 refs.

At the County Hospital in Sundsvaal, Sweden, during the period July 10, 1947, to Aug. 20, 1947, the blood groups of 129 mothers admitted to the obstetrical unit were determined. Many of the babies and their fathers were examined in the same way. Of 31 mothers, the fathers of whose infants belonged to blood group O, only one showed any sign of toxaemia of pregnancy. In 59 cases in which the father and mother belonged to the same blood group and in 7 cases in which the mother belonged to group AB there was also no toxaemia. In 11 cases of toxaemia, the blood groups of father and mother were different, the father's group being A, B, or AB, and the mother's group O, A, or B. In some of these cases the infant and its mother belonged to the same group.

It is thought probable that toxaemia of pregnancy depends on two factors, the hypertrophy of hypophysis and thyroid normally associated with pregnancy and an extraneous factor depending on the blood group to which the father belongs. If he belongs to group O or the mother to group AB, or if both belong to the same blood group, the pregnancy is regarded as homologo-specific. All other pregnancies are considered hetero-specific, and it is in these that toxaemias of pregnancy develop, notably when the mothers are primiparae. On the assumption that toxaemia of pregnancy is an allergic reaction depending on the character of the father's blood, desensitization of the mother with intracutaneous injections of the father's blood is recommended early in pregnancy when the latter has been found to be hetero-specific. Such desensitization must be started before injury to the

vascular system has become serious. A report on the results of these prophylactic measures is promised in the near future. Claude Lillingston

1474. Serologic Observations in the Toxemias of Pregnancy.

By R. T. LA VAKE. Minnesota Med., 31, 372-375, Apr. 1948.

1475. Clinical Investigations and Considerations on the Influence of the War Years on Pregnancy. II. Influence on Toxaemias of Pregnancy: Albuminuria. (Indagini cliniche e considerazioni circa l'influenza del periodo bellico sullo stato puerperale. II. Influenza sulle tossicosi gravidiche: Albuminuria.)

By S. Canna. Ginecologia, Torino, 13, 430-442,

Sept. 1947. 4 figs., 47 refs.

A comparative clinical and statistical survey has been made of the incidence of albuminuria, toxic neuritis, and icterus gravis in pregnancy during the periods of peace and war between 1933 and 1945 in Novara. Albuminuria was the more frequent form of toxaemia, while toxic neuritis and icterus made up a very small percentage. The curves of frequency of all these toxic manifestations were similar and for this reason the author has considered them as a whole. The relations between toxaemias and primiparity or multiparity, living conditions, and occupation during pregnancy have been investigated.

A maximum of 8.3 per cent of toxic manifestations was found in 1934 among 635 deliveries and a minimum of 1.3 per cent in 1945 among 577 deliveries. In the period between 1933 and 1939 the average was 6.5 per cent (4,523 deliveries) and in the period between 1940 and 1945, 2 per cent (4,113 deliveries). An average of 8.7 per cent was found in peacetime among primigravidae (1,958 deliveries) and 2.8 per cent in wartime (1,830 deliveries); the figures for multigravidae were 5 per cent (2,555 deliveries) and 1.4 per cent (2,283 deliveries) respectively. Women living in the country had better food than those living in towns. For urban patients the average incidence was 5.8 per cent in peacetime (2,305 deliveries) and 2.3 per cent in wartime (2,214 deliveries); for those from the country the figures were 7.4 per cent (2,218 deliveries) and 1.8 per cent (1,949 deliveries). Toxic manifestations were found in 7 per cent of women who did only housework during pregnancy in peacetime (1,949 deliveries) and in 2.8 per cent in wartime (2,116 deliveries); in 5.5 per cent of factory workers in the first period (1,665 deliveries); and in 1.4 per cent during the second (1,327 deliveries); in 9.5 per cent of landworkers in the first period (908 deliveries), and in 0.9 per cent in the second (660 deliveries). Since fewer land workers attended the Obstetric Clinic of Novara during the war these percentages cannot be regarded as con-

From this investigation it appears that there was a decrease in toxic manifestations during the war.

The percentage was slightly lower for multiparae than for primiparae. The decrease was more noticeable among women living in the country and among land workers. The factors which may have caused these phenomena are discussed. It is the author's opinion that the nutritional factor is important in this decline in incidence of toxaemia. Carbohydrates, vegetables, and fruit figured prominently in the diet of pregnant women in the province of Novara, while animal protein and lipids were less than in peacetime.

Rina Saunders

1476. A Case of Toxic Pyelonephritis of Pregnancy Cured by Infiltration of the Renal Pedicles and Medical Treatment. (Sur un cas de pyélonéphrite gravidotoxique guérie par infiltration des pédicules rénaux et traitement médical.)

By R. Mahon and —. Chastrusse. Rev. franç. Gynéc., 42, 324–333, Nov. 1947. 1 fig., 15 tefs.

The authors describe a case of toxic pyelitis of pregnancy in a primigravida, due to Bacterium coli, which persisted after delivery and was still present in a second pregnancy. The patient's general condition was poor; there was much wasting, necessitating the administration of glucose and insulin. At the onset of her illness there was oliguria with azotaemia, severe anaemia, and jaundice. The first pregnancy terminated in spontaneous delivery of a living child at the eighth month. At the height of the oliguria, and after intravenous procaine had proved ineffective, the renal pedicles were infiltrated with 20 ml. of 1 per cent procaine on both sides. This resulted in satisfactory diuresis. [This patient also received a large dose of penicillin, 800,000 units in all. This appears to have been given without a penicillin-sensitivity test on the organism, and there is no record of any trial of sulphonamides, which are usually more effective Josephine Barnes in cases of this kind.]

1477. Renal Manifestations of Toxaemia of Pregnancy. (Las manifestaciones renales de la gestosis.)
By V. Marino Donato. Sem. méd., 55, 879-884,
May 27, 1948.

1478. The Influence of Toxaemias of Late Pregnancy on the Fate of the Foetus. (Der Einfluss der Spätschwangerschaftstoxikose auf das kindliche Schicksal.)

By V. Dubrauszky and E. Ott. Geburtsh. u. Frauenheilk., 8, 376-384, Apr. 1948.

1479. Elevated Blood Pressure in Pregnancy. A Report of 1,800 Cases.

By W. F. DILLON and H. E. SCHMITZ. Amer. J. Obstet. Gynec., 54, 948-957, Dec. 1947. I fig., I

The authors take 140/90 mm. Hg as the standard of normal blood pressure. From 1931 to 1945 inclusive 28,263 women were delivered at the Lewis Maternity Hospital, Chicago. Of these, 1,800, or

6.36 per cent, had a blood pressure of or over the above standard during all or a part of their pregnancy. Pre-eclampsia was present in 5.14 per cent, eclampsia in 0.18 per cent, nephritis in 0.04 per cent, and hypertension in 1.0 per cent; 3.4 per cent of the pre-eclamptic patients progressed into eclampsia. In the pre-eclamptic group the percentage of primiparae was 52 and of multiparae 48; in the eclamptic group the percentages were primiparae 80 and multiparae 20. The nephritic group contained 50 per cent of each; and of the hypertensive patients 25 per cent were primiparae and 75 per cent multiparae. In 90 per cent of each group the rise in pressure was first demonstrated after 30 weeks. Of the eclamptic group there was headache in 70 per cent, epigastric pain in 32 per cent, visual disturbance in 46 per cent, and albuminuria in 98 per cent. The convulsions were antepartum in 35 per cent, intrapartum in 33 per cent, and postpartum in 31 per cent. Among the 51 eclamptics there were 4 maternal deaths and 25.3 per cent of the babies were stillborn or died in the neonatal period.

Treatment is discussed in some detail. All normal patients are given an 1,800-calorie diet made up of 85 g. protein, 75 g. fat, and 200 g. carbohydrate. A salt-free diet containing 85 g. protein is instituted with sedatives and enteric-coated tablets ammonium choride, 11/2 to 6 g. daily, if the pressure begins to rise and the weight to increase suddenly. Absolute rest in bed in hospital is indicated if the blood pressure remains over 140/90. Hypertonic glucose in water, sedatives, and parenteral magnesium sulphate are used in amounts commensurate with the severity of the toxaemia. For the eclamptics medical measures are employed. If the pregnancy must be terminated because of failure to respond to medical treatment and the cervix is in a state which contra-indicates delivery from below, Caesarean section is carried out under local analgesia.

Dieckmann, in discussing this paper, said that in his clinic the incidence of toxaemia had, not decreased in the last 10 years. Eclampsia, however, had almost disappeared and at most there was only 1 case a year. "As the doctors in the clinic become more experienced watching for excessive weight gain, for increases in systolic blood pressure, our results in the treatment of these toxaemic patients improve. The patients are put under dietary control and bed rest at an earlier date."

F. J. Browne

1480 The Significance of Hypertension in Pregnancy.

By L. F. RITMILLER, I. L. MESSMORE, and R. E. NICODEMUS. *Pennsylvania med. J.*, 51, 771-775, Apr. 1048. 6 refs.

1481. Diminished Incidence of Eclampsia during the War and Post-War Increase. (Verminderling van

eclampsie tijdens de oorlog en toeneming daarvan na de oorlog.)

By W. VAN ESSEN. Ned. Tijdschr. Geneesk., 91,

3629-3633, Dec. 13, 1947. 1 ref.

In Deventer (Holland) among 3,174 confinements during the war years 1942-4 not a single case of eclampsia occurred; in 1946, out of 1,339 confinements, there were 6 cases and 2 of the mothers and 5 of the infants died. The average daily intake of protein during the war years was 100 to 120 g., a restricted amount but still within the normal limits. On the other hand, there was a scarcity of salt, the consumption of which, particularly among the rural population, was very low. The absence of eclampsia is attributed by the author to the low salt intake, and he advises a low-salt diet as the main precaution where this condition is feared.

A. Lilker

1482. New Electrocardiographic Observations in Eclampsia and Pre-eclampsia. (Neue elektrokardiographische Untersuchungen bei der Eklampsie und ihren Vorstadien.)

By G. MESTWERDT. Zbl. Gynäk., 69, 759-765,

1947. 4 figs., 31 refs.

In eclampsia and pre-eclampsia changes in the capillaries are constantly found. The electrocardiographic observations carried out by the author revealed functional disorders of the cardiac muscle, probably due to functional disorders of the cardiac capillaries. He advocates periodic electrocardiographic control during pregnancy in the early diagnosis of pre-eclampsia and eclampsia.

Kate Winkler

1483. The Treatment of Eclampsia and Preeclampsia with Veratrum Viride and Magnesium Sulfate.

By F. C. IRVING. Amer. J. Obstet. Gynec., 54.

731-737, Nov. 1947. 1 fig., 22 refs.

Bryant in 1935 (Amer. J. Obstet. Gynec., 30, 46) reintroduced veratrum viride into the therapeutics of obstetrics. He reported its use in a series of 121 cases of eclampsia with a mortality of 9.9 per cent. In view of Bryan's paper the author decided to use his technique at the Boston Lying-in-Hospital. The pharmacology of the drug is discussed, and a historical review of its use is followed by a description of the technique of administration. Patients on admission are given either morphine gr. 1/4 (16 mg.), pethidine 100 mg. or paraldehyde 3 drachms (10.5 ml.) as a sedative, and 5 minims (0.3 ml.) of "veratrone"; 10 to 20 ml. of 50 per cent magnesium sulphate is administered intramuscularly every 4 to 6 hours and 250 ml. of 25 per cent glucose intravenously every 4 to 6 hours. The veratrone in 5-minim doses is repeated every 25 minutes to keep the systolic blood pressure below 150 mm. Hg. From 1940 to 1946, 32 patients with eclampsia were treated in this way. There were 2 maternal deaths (6.3 per cent). Half the total number of patients treated were admitted as emergencies; 18 of the 33 infants born were discharged alive (54.5 per cent).

A graph demonstrates the maternal mortality from eclampsia for the preceding 70 years (the average percentage death rate per year being 28.3). A table also shows different authors' results with magnesium sulphate treatment, with or without veratrone. Results obtained with veratrone appear to be better than those obtained with magnesium sulphate alone.

Brailhwaite Rickford

1484. Fatal Eclampsia. A Clinical and Anatomic Correlative Study.

By G. T. C. WAY. Amer. J. Obstet. Gynec., 54,

928-947, Dec. 1947. 9 figs., 59 refs.

This paper summarizes the postmortem findings in 33 cases of eclampsia. In 8 of the cases there were no convulsions; 32 of the patients had hypertension, blood pressure varying from 140 mm. systolic to over 200. One patient was in shock on admission and the blood pressure was 80/40 mm. Hg. Generalized oedema was present in 78 per cent of the patients on admission, and 69 per cent were in coma. The author is not impressed by the tubulan changes in the kidney. The glomerular changes he describes in 3 stages: (1) Non-vascular glomeruli, increase in glomerular nuclei, moderate thickening of basement membrane, no visible changes in arterioles. (2) Non-vascular glomeruli, increase in glomerular nuclei, arteriolar thickening, marked thickening of basement membrane, fibrinoid changes in glomeruli and arterioles. (3) Scattered obliterated hyalinized glomeruli, fibrosis beneath Bowman's capsule, generalized arteriolosclerosis, kidney of arteriolo-nephrosclerosis. Six of the cases were in stage 3. An analysis of the cases in each stage showed that the proportion of primiparous patients fell from 82 per cent in stage I to 50 per cent in stage 2, and to o in stage 3. Also, with one exception, the findings in multiparae with a history of preceding toxaemia were confined to stages 2 and 3. The average age for each group rose from 19.3 years to 30.8 in the progressive stages of renal injury. The average duration of symptoms in all stages was practically the same—26.6, 25.3, and 28.4 days.

In the adrenals the chief findings were necrosis and haemorrhage. These lesions were present in II patients; in 5 they were so severe that practically no functional adrenal cortical tissue remained. It is emphasized that normal blood pressure in toxaemic patients does not preclude the presence of shock, and that after marked hypertension a reduction to normal levels may be coincident with the existence of the shock syndrome. It is suggested that adrenal insufficiency may be a contributing factor to a fatal termination in certain patients. Pneumonia was present in 16 cases and bilateral hydrothorax in I case. There were haemorrhages in the heart in 12 patients and in 4 of these there was focal necrosis of the myocardium. Myocarditis was seen in 2 cases and focal acute endocarditis in one. Focal necrosis of the brain was present in I

case and cerebral haemorrhage in 3 cases, in 2 of which it was massive; in these 2 cases there was cerebral arteritis and arteriolitis with necrosis of the vessel walls. Acute purulent mastitis was found in 1 case, and this had been followed by eclampsia and death in 36 hours after the first symptom.

The author considers that the underlying cause of all these lesions is the vasoconstriction. This he attributes tentatively to the euglobulin toxic factor found in menstrual flow by Smith and Smith, and which can also be produced in any area where there is tissue destruction, such as might arise in a focus of infection or in a senile placenta. The lethal action of the toxin may be assisted by the increased sensitivity of the vascular system which has been shown to be present in pre-eclampsia toxaemia and to be acquired at some time after the seventeenth week of pregnancy. The increased incidence of eclampsia in patients with pre-existing chronic hypertension might be due to the fact that uterine vascular changes bring about a relatively inadequate uterine blood supply and in turn premature senile changes in the placenta.

[The abstracter ventures to suggest that the hypertension with resultant vascular spasm in the spiral arterioles of the decidua may produce haemorrhages and tissue destruction. From such destroyed areas, either in the decidua or in the placenta, the lethal substance (necrosin?) may arise. This hypothesis brings us very near to Young's views on the aetiology of eclampsia (vide Proc. R. Soc. Med., 1914, 7, Sect. Obstet. Gynaec., 307). The difficulty in all existing theories is to explain why eclampsia occasionally occurs 3 or 4 days after the placenta is delivered.]

F. J. Browne 1485. Employment of Aqueous Solution of Adrenal Cortex Hormone in a Case of Eclampsia. (Použití vodného roztoku hormonu kory nadledvinkové u

By M. Vojta. Ceskoslov. Gynaek., 13, 233-240,

1948.

pripadu eklampsie.)

1486. Postpartum Eclampsia. (A propos de l'éclampsie du post-partum.)

By E. Houel and H. Ézes. Gynéc. et Obstét., 47, 330-334, 1948.

1487. Treatment of Vomiting of Pregnancy with Amino-acids. (Essai therapeutique des vomissements gravidiques par les acides amines.)

By H. Fobe. Therap. Umsch., 5, 33-37, June

1948. 23 refs.

1488. Placenta Previa.

By A. L. DIPPEL. Amer. Practit. Phila, 2, 597-602, May 1948. 4 figs., 4 refs.

1489. Treatment of Placenta Praevia. (Consideraciones sobre tratamiento de la placenta previa.)

By I. R. Gonzalez Bol Soc. chil. Obstet.

By J. R. GONZALEZ. Bol. 500. 600. Ginec., 12, 310-326, Dec. 1947.

1490. The Pathological Physiology of Acute Loss of Blood in Pregnant and Non-pregnant Women. (Zur Pathophysiologie des akuten Blutverlustes bei Frauen mit und ohne Schwangerschaft.)

By H. Schwalm. Arch. Gynäk., 176, 70-99,

1948. 8 figs., 48 refs.

1491. A Premature Survival Index and the Conduct of Premature Labor.

By A. L. DIPPEL, H. W. JOHNSON, and J. L. CORNELISON. Amer. J. Obstet. Gynec., 54, 1004-

1012, Dec. 1947. 9 refs.

The authors survey the definition of the premature infant, offer a "premature survival index", and suggest certain rules for the conduct of There is no unanimity of premature labour. opinion on what constitutes a premature infant, and no standard is universally accepted. Many factors are involved in the assessment of the term. One of the authors (Johnson) suggests that a combination of a large number of the factors concerned in the term "prematurity" should give rise to less inaccuracy than has so far resulted from the use of one factor alone. The suggested index is based upon five points: gestational period; weight of the newborn child in ounces; total or crown-heel length of the infant; occipito-frontal circumference of the head, recorded in inches; and the circumference of the chest at the level of the xiphisternal joint, also recorded in inches. The recorded figures for each of these measurements or factors, divided by five, give the index figure. The authors have applied their standard to 23 premature infants, and, while pointing out that the number of cases is too small to permit of permanent conclusions being drawn, suggest that certain useful information is already forthcoming from the method. Their suggestions for the reduction of the mortality rate in premature infants include the avoidance of analgesia after the onset of true labour; the use of local or regional analgesia for delivery; preservation of the membranes throughout the second stage of labour; the maintenance of the maternal-foetal circulation for as long a period as possible; and the prophylactic use of chemotherapy in the premature child irrespective of any antenatal or intrapartum Frankland L. Cary infection

1492. Influence of Endogenous Factors (Ovarian Insufficiency) and Exogenous Factors (Profession) on the Origin of Premature Labour. (Der Einfluss endogener Faktoren (Ovarialinsuffizienz) and exogener Faktoren (Berufsarbeit) auf die Entstehung von Frühgeburten.)

By H. Kirchnoff. Geburtsh. u. Frauenheilk.,

7, 78-86, Nov. 1947.

Although since 1901 mortality during the first year of life has fallen considerably, mortality at birth and in the following 10 days has not decreased proportionately. In 14,564 pregnancies in Leipzig there was a primary infant mortality of 5.4 per

postintrapartum, and (antepartum, partum); 25.5 per cent of deaths were associated with prematurity; 33 per cent took place during labour and 41.5 per cent within the first 10 days of life. Birth trauma accounted for 30 per cent of all the deaths and placental abnormalities and lesions of the cord for 23 per cent. The author found that about 50 per cent of all deaths were associated with a birth weight of 2.5 kg. or under, and 60 per cent with a weight below 2.8 kg. Although some of these deaths may be explained by developmental abnormalities, the majority are due to unknown factors. It was previously noted in Leipzig (1933-37) that 52 per cent of mothers who gave birth to premature infants had symptoms of genital hypoplasia or ovarian insufficiency, and these are considered important endogenous factors premature birth and associated foetal mortality. A further influence may be the social status of the mother and whether or not she works during the pregnancy. Some 13,000 cases were examined from this point of view; 40 to 50 per cent of pregnant women were found to be at work in different years of the analysis. In those who worked the percentage of premature births was 15.2, in those who did not work 10.5; detailed analysis showed varying percentages according to the type of work done (for example, 17.2 per cent in industrial factory workers, and 11.8 per cent in those working in hotels). In the working group the membranes ruptured prematurely in 41 per cent of all births compared with 30 per cent in the other group. Premature labour was less common if there was a period of rest at the end of the pregnancy; in those who did not rest the percentage of premature births was 26 to 36, compared with 6.5 to 10 per cent in patients who did not "work" for 70 to 90 days before delivery. It appeared that birth weights were higher in the " resting " group and that pregnancy was prolonged slightly in the industrial worker. Kenneth Bowes

1493. Causal Connexion Between Repeated Abortion and Premature Labour and Pathological Spermatozoa. (Uber die Frage eines ursächlichen Zusammenhanges zwischen wiederholten Fehl- und Fruhgeburten und krankhaftem Sperma.)

By P. Rottger. Zbl. Gynäk., 69, 1133-1139,

1494. Preservation of the Threatened Pregnancy with Particular Reference to the Use of Diethylstilbestrol.

By G. ROSENBLUM and E. MELINKOFF. West. J. Surg. Obstet. Gynec., 55, 597-603, Nov. 1947.

Bibliography.

There is little doubt that abortion is heralded by a drop in the level of pregnandiol excretion in the urine, which is presumed to indicate a reduced progesterone content in the blood, but there is some evidence that an attempt to remedy this by the administration of progesterone further reduces the output of pregnandiol. This effect can be avoided if oestrogens are given at the same time. Oestrogen therapy alone might be expected to be equally effective, since it prevents regression of the corpus luteum when injected into rabbits and causes enlargement of both follicles and corpora lutea in hypophysectomized rats. Administration of oestrogens to pregnant women increases the output of progesterone. Abnormal metabolism of the sex steroids begins during the second trimester, so that endocrine treatment must be started by the sixteenth week.

Diethylstilboestrol was given in 96 cases of abortion, habitual abortion, and threatened premature labour. At the onset of symptoms of abortion the patient was sent to bed and given 5 to 25 mg. diethylstilboestrol orally, 25 mg. every hour until symptoms subsided, and thereafter 5 mg, three times daily until at least the twentieth week. In threatened premature labour 25 mg. was given hourly until contractions ceased, then 5 mg. three times daily until the thirty-sixth week. In habitual abortion 5 mg. was given three times daily until the twentieth week, when the dose was increased by 5 mg. weekly until the thirtysixth week and then discontinued. In addition, all received the usual vitamin and mineral supplements and "rather frequent . . . small doses of thyroid ". No important toxic effects were noted; some mothers and babies showed transitory pigmentation of the areola and linea nigra. Two mothers had toxaemia. All the babies survived except I with multiple deformities. The results of the investigation are shown in the following table:

	Stilboestrol				Progestogens			
Condition	No.	Carried Aborted		No.	Carried Aborted			
Threatened abortion	82	71	11 (13 4%)	86	56 (65.1%)	30 (34 9%)		
Habitual abortion	10	(50%)	(50%)	7	(28 6%)	2		
Threatened premature labour	4	(75%)	(25%)	1	0	(100%)		

The author states that these results are better than any he has been able to achieve with other methods. There are several questions relating to the use of the oestrogens which require further investigation—for example, the possibility of producing permanent glandular disturbance in mother or child and the carcinogenic effect of such large doses. [A comprehensive bibliography of the literature relating to the endocrine aspects of abortion is appended.]

Margaret Puxton

1495. Interruption of Pregnancy. (Nogle Bemærkninger om Svangerskabsafbrydelse.)

By J. FABRICIUS-MOLLER. *Ugeskr. Læg.*, 110, 721-724, June 17, 1948.

1496. The Blood Phosphatase During Abortion. (Etude de la phosphatasémie au cours des avortements.)

By R. Burthiault, R. Berger, and J. Gonnet. Gynéc. et Obstét., 47, 347-348, 1948.

1497. Therapeutic Abortion from the Point of View of the Internist.

By H. M. Korns. J. Amer. med. Ass., 137, 333-336, May 22, 1948. 2 refs.

1498. Indications for Therapeutic Abortion from the Point of View of the Surgeon.

By S. C. HARVEY. J. Amer. med. Ass., 137, 331-332, May 22, 1948. 6 refs.

1499. Therapeutic Abortion by Means of Soft-Soap Pastes.

By H. H. F. BARNS. Lancet, 2, 825-827, Dec. 6,

1947. 3 figs., 4 refs.

To induce therapeutic abortion the author has used a soft-soap paste containing stearic acid 10 per cent, arachis oil 20 per cent, alkaline solution (potassium hydroxide 9.5 parts, sodium hydroxide 3.75 parts; and water to 100 parts) 20 per cent, lanette wax " 1.5 per cent, chlorocresol 0.05 per cent, and water to 100 per cent; the paste is sterilized in the autoclave. No anaesthetic is required for its injection, which is made between the membranes and the wall of the uterus with a 20-ml. syringe and a Forsdike intrauterine tube. One ml. is used for each week of pregnancy plus 5 ml. to allow for the quantity in the tube itself. Because success is uncertain, the paste should not be employed if the pregnancy has lasted more than 16 weeks; neither should it be used before 10 weeks, as the ovum has not obliterated the cavity of the uterus. The method was successful in 80 per cent of a total of 71 cases. There were no fatalities and no accidents such as have been described in the literature—haemolysis, perforation of the uterus, septic infection, and haemorrhage. Abortion usually took place within 24 to 48 hours and in most cases was complete, but in a few it was incomplete, and ecbolics were required to complete it. In I patient who was 16 weeks pregnant the paste was mixed with a radio-opaque substance "neohydriol". X-ray examination showed some of the paste in the Fallopian tube and, 4 days after the abortion, in the pelvic portion of the peritoneal cavity. It is concluded that the method, in suitable cases, compares favourably with other methods of terminating early pregnancy. It has the great advantages that no general anaesthetic is required, the procedure only takes a few minutes, and there is a minimum of manipulation with little or no loss of F. J. Browne blood.

1500. Cerebral Accidents during Abortion Provoked by Intrauterine Injection. (Accidents cérébraux au cour d'un avortement provoqué par injection intrautérine.)

By R. Rouchy. C. R. Soc. franç Gynéc., 18, 78-80, Mar. 1948.

1501. Uterine Necrosis Due to Intrauterine Injections of Soap-suds. (A propos de six cas d'infarctus utéro-annexiel ou nécrose alcaline de l'utérus par injection intra-utérine d'eau de savon.)

By A. TURRETTINI. *Praxis*, 37, 343-349, May 13, 1948. 7 refs.

1502. Ligation of the Inferior Vena Cava and Ovarian Veins for Infected Abortion.

By H. F. NEWMAN. Amer. J. Surg., 75, 746-748, May 1948. 4 refs.

1503. Cervical Fibroids and Pregnancy. (Cervikální myomy a těhotenství.)

By A. Kotasek. Ceshoslov. Gynaek., 13, 191-197, 1948. 2 figs., 10 refs.

1504. Pregnancy and Ovarian Cyst. (Gravidez e cisto do ovario.)

By P. Osorio. *Hospital, Rio de J.*, 33, 621-631, Apr. 1948. 4 figs., 9 refs.

1505. Acute and Chronic Intoxications in Pregnancy. (Intoxicaciones agudas y crónicas en relación con la gestante.)

By L. A. BUENAPOSADA. Clin. y Lab., 45, 438-443, June 1948. 10 refs.

1506. Phaeochromocytoma in Pregnancy. (Een phaeochromocytoom in de zwangerschap.)

By A. J. A. HOOGEVEEN. *Ned. Tijdschr. Geneesk.*, 92, 1681-1690, June 5, 1948. 10 refs.

1507. Peptic Ulcer and Pregnancy. Four Cases and a Review of the Literature.

By S. P. Bralow, S. Scheinberg, and H. Necheles. Amer. J. digest. Dis., 15, 137-141, May 1948. Bibliography.

1508. Intestinal Obstruction Complicating Pregnancy.

By S. A. Siegel and N. Pleshette, N.Y. St. J. Med., 48, 1264–1267, June 1, 1948. 13 refs.

1509. Appendicitis in Pregnancy (Considerations on the Cases at the Obstetric Clinic, Pavia, from 1935-1946). (L'appendicite in gravidanza. Considerazioni sulla casistica del decennio 1935-46 nella Clinica Ostetrica di Pavia.)

By G. Picinelli. Monit. ostet.-ginec., 18, 97-

124, Jan.-June 1947. 34 refs.

The author presents a clinical and statisical survey of the cases of appendicitis seen at the Obstetric Clinic of Pavia in the last 10 years. Among 9,664 pregnant women admitted, appendicitis was encountered 24 times—23 of the patients had chronic and subacute forms and 1 had acute appendicitis. The low incidence of acute appendicitis is related to the routine performance of appendicectomy early in pregnancy in mild cases, so as to avoid complications later on. Appendicitis was encountered four times in the second month of pregnancy, six times in the third month, seven

times in the fourth, twice in the fifth, twice in the seventh, and three times during labour.

Appendicectomy was performed during pregnancy twenty-one times. Administration of morphine and abdominal application of an ice-bag was the routine after each operation. In 16 patients pregnancy continued without any disturbance. Of the other 5, 1 who was pregnant at the seventh month had a premature delivery with a living infant 7 days after the operation, Porro's operation was performed during labour in 3 cases (living infants), and I woman aborted 36 days after operation. Appendicectomy was performed in the other 3 cases a few days after the women had Two of these were admitted with aborted. threatened abortion and I with missed abortion. The postoperative period was uneventful in all

In a discussion all the speakers agreed that acute appendicitis during pregnancy always has a bad prognosis, and that the foetal and maternal risk is high, especially in the late months of pregnancy, and above all during labour. The author urges that appendicitis during pregnancy requires operation as soon as possible. The early adoption of Porro's Caesarean section is suggested for the treatment of acute appendicitis during labour.

Rina Saunders

1510. Pregnancy Complicated by Transmesenteric Hernia.

By J. M. MILLER. Amer. J. Surg., 75, 739-742, May 1948. 7 refs.

1511. Observations on the Occurrence of Anemia in Pregnancy.

By W. Koch, D. Kaplan, and A. Sadovsky. *Med. Rec.*, *N.Y.*, 161, 223-225, Apr. 1948. 2 figs., 3 refs.

1512. A Case of Sickle Cell Anemia Complicating Pregnancy.

By W. J. FETTER. Bull. Sch. Med. Maryland, 32, 210-214, Apr. 1948. 1 fig., 14 refs.

1513. The Rh Factor in Clinical Obstetrics and Gynecology.

By J. W. DAVENPORT. New Orleans med. surg. J., 100, 510-517, May 1948. 18 refs.

1514. Clinical Problems and Methods of Studying the Rh Factor for Gynaecologists. (Klinische Probleme und Methodik zur Erfassung des Rh-Faktors für den Gynäkologen.)

By H. Hocks. Geburtsh. n. Frauenheilk., 8, 438-449, May 1948.

1515. Maternal Rh Sensitization and the Clinically Normal Child.

By B. B. CARTER. Amer. J. Obstet. Gynec., 54, 879-882, Nov. 1947. 17 refs.

Since the Rh factor was first described it has been found difficult to account for the discrepancy

between the number of instances of Rh-negative mothers with Rh-positive children (r out of 10 pregnancies) and the incidence of erythroblastosis foetalis (I case in 200 deliveries). Four cases of maternal sensitization with no evidence of erythroblastosis foetalis in the child are presented. In all of them Rh agglutinins were demonstrable in the serum shortly after delivery and in I case some weeks before delivery. When the breast milk was tested it was found to contain Rh agglutinins. Although the babies were apparently healthy, Rh agglutinins could be demonstrated in 3 of them. Previous explanations, such as the inaccessibility of the maternal agglutinins to the baby's red cells or the immunity of the child's maternal red cells seem, therefore, unsatisfactory. D. M. Stern

1516. Production of Anti-Rh Sera from Placental Tissue of Sensitized Women.

By J. J. Engelfried and F. R. Henry. Nav. med. Bull. Wash., 48, 370-372, May-June 1948.

1517. Death after Auto-transfusion. (Todesfall nach Reinfusion.)

By E. E. Manuelidis. Geburtsh. u. Frauenheilk., 8, 431-438, May 1948. 1 fig., 27 refs.

1518. Spontaneous Subarachnoid Haemorrhage in Pregnancy. (Spontan subaraknoidalblodning ved graviditet.)

By H. RAMSTAD. Nord. Med., 38, 888-889, Apr. 30, 1948. 2 refs.

1519. The Inter-relationship Between Pregnancy

and Urinary Tract Disorders: with Case Report. By L. LAHN. Urol. cutan. Rev., 52, 140-144, Mar. 1948. 1 fig., 10 refs.

1520. Pyclonephritis in Early Pregnancy. (Pielonefritis precoz del embarazo.)

By C. E. DE LA COLINA and E. M. BALDI. Obstet. Ginec. lat.-amer., 6, 91-102, Mar.-Apr. 1948. 6 figs., 16 refs.

1521. Uro-surgery in Relation to Pregnancy. By C. J. E. KICKHAM. J. Urol., 59, 953-959, ' May 1948. 6 refs.

1522. Diabetes Insipidus and Uterine Atony. A Case Observed over a Period of 26 Years.

By G. Maranón. Brit. med. J., 2, 769-771, Nov.

15, 1947. 12 refs.

The author describes a successful pregnancy in a patient with diabetes insipidus who had been observed over 26 years. The patient was first seen in 1921, aged 17; 4 months previously after sudden immersion in water at the seaside she began to complain of severe thirst and polyuria. Apart from irregular menstruation and reduction in the visual fields nothing of note was observed clinically. She was treated by injections of pituitrin which had to be stopped after the first ten because of dizziness and faintness. Five years later the condition was

unchanged, but the patient had severe headache and was passing 20 litres of urine per day. There was an increase in size of the left breast and enlargement of the areola and nipple. New pituitary extracts were tried without effect. In 1933 the patient was delivered at term of a stillborn infaut after 5 days without uterine contractions, labour never having properly started. She now had intense headache and projectile vomiting. In February, 1935, she had improved, and her urinary output was 7 litres per day. In October, 1935, she became pregnant again and the author advised pituitary extract on parturition. She was delivered of a living child. She was again pregnant in May 1936, but pituitrin was not available and labour pains ceased after the onset of labour. Three days later a dead foetus had to be removed. In April 1947 the patient was seen again, aged 43, living a normal life and now quite accustomed to her polyuria and thirst. A radiograph of the cranium was normal except for slight frontal hyperostosis.

The author describes his case as one of essential diabetes insipidus due to a disturbance of the hypothalamic-pituitary mechanism. The history of the sudden immersion suggests that the condition may have been due to a pathological prolongation of a normal physiological occurrence. He draws attention to the role of the posterior pituitary in the mechanism of parturition and compared the findings' with those in animal experiments. He attributes the syndrome of uterine atony to a hypothalamic-posterior-pituitary insufficiency. A full bibliography of previous cases is given.

B. Sandler

1523. An Investigation of Pregnancy in Diabetic Animals. [In English.]

By G. HULTQUIST. Acta path. microbiol. scand., 25, 131-140, 1948. 3 figs.

1524. General Infections of Pregnancy. By J. C. BROUNGHER. Northw. Med., Seattle, 47. 356-358, May 1948. 11 refs.

1525. The Estimation of Penicillin in the Amniotic Fluid, Foetal Blood, and the Maternal Blood. (Stanoveni penicilinu ve vodě plodové, v krvi pupečnikové a v krvi materske.)

By J. Novák. Ceskoslov. Gynaek., 12, 422-432,

1947. 4 refs.

In order to ascertain the effect on the foetus of penicillin given to the mother antepartum, and its possible prophylactic value, the author determined penicillin levels in the amniotic fluid and foetal and maternal blood. The first 13 tests were carried out by the Oxford method, but as quantitative assessment was not possible by this technique, another was chosen. A series of decreasing concentrations of amniotic fluid and a foetal and maternal serum in physiological saline were mixed with a suspension of β-haemolytic streptococci in broth plus defibrinated blood of group O (1 in 100).

By this technique, which is described in detail, 64 tests were made, 30,000 units of penicillin being given to the mother by intramuscular injection at a time when delivery was expected within 2 hours. The results were grouped according to the interval after injection when delivery occurred. In the amniotic fluid, penicillin was found only in 6 cases in practically insignificant quantities. In the foetal and maternal blood, therapeutic levels were found 30 to 60 minutes after injection, lower levels before and after this period, and very low levels 90 to 140 minutes after injection.

A. Rohan

1526. Sulphonamide Metabolism in the Organism in Pregnancy and the Puerperium. (Untersuchungen zur Frage des Sulfonamidstoffwechsels im Organismus der Schwangeren und Wöchnerinnen.)

By G. GAEHTGENS. Z. Geburtsh. Gynäk., 128, 225-247, 1947. 7 figs., 6 refs.

This article includes reports on the excretion rates of free and conjugated sulphonamides in women during pregnancy and the puerperium. [The total number of patients is not stated, but results are given for groups of 15 to 20 patients with each treatment.] Treatment consisted of the administration of "marfanil-prontalbin" alone, or the sulphonamide was given in conjunction with a vitamin preparation, vitamin B, or vitamin C. A greater proportion of acetylated sulphonamide was excreted by pregnant women than by non-pregnant women. The simultaneous administration of the water-soluble vitamin preparations led to an increase in the sulphonamide excretion and to a probable increase in the elimination of the amount of sulphonamide in a conjugated form. authors point out that when increased amounts of the acetylated sulphonamide derivatives are excreted it is important to guard against urolithiasis, and they therefore recommend the administration of sodium bicarbonate and sodium citrate. Alternatively, only those sulphonamide preparations should be used which do not tend to produce crystalluria.

The results might be partly explained by the diuresis that occurs in pregnancy and by the hypovitaminosis which is commonly present during the puerperium. This is supported by the fact that in the normal healthy subject the administration of vitamin B<sub>1</sub> or vitamin C does not lead to an increase in sulphonamide excretion. However, the authors feel that attention should be drawn to the fact that in the treatment of infections after confinement the simultaneous administration of water-soluble vitamins with sulphonamides might lead to an increase both in the excretion of the sulphonamide and in the amount which is conjugated.

R. Wien

1527. Pulmonary Tuberculosis and Pregnancy. (Lungentuberkulose und Schwangerschaft.)

By H. GOECKE. Geburtsh. u. Frauenheulk., 8, 423-431, May 1948. 39 refs.

1528. The Placental Factor in Pathology of Pregnancy. (El factor placentario en patologia gravidica.)

By P. Nubrola. An. Med. Cirug., 23, 234-240, Apr. 1948.

1529. Effective Methods of Combating Intrauterine Foetal Asphyxia. [In Russian.]

By A. P. NIKOLAEV and M. M. TYURINA. Akush. Ginek., No. 1, 5-13, 1948.

1530. Twin Pregnancy with Hydramnios of One Sac. (Contribution to Radiological Diagnosis.) (Emarazo gemelar con polihidramnios de uno de los huevos. Contribución a su diagnóstico radiológico.)

By J. Leon. An. brasil. Ginec., 13, 183-188, Mar. 1948. 1 fig.

1531. Combined Extrauterine and Intrauterine Pregnancy.

By J. O. Rude. Northw. Med., Seattle, 47, 358, May 1948.

1532. Extrauterine Pregnancy. (Uber extrauteringraviditaten.)

By H. Heberer. Geburtsh. u. Frauenheilk., 8, 397-400, Apr. 1948.

1533. Seven Months' Extrauterine Abdominal Pregnancy. (Embarazo extrauterino abdominal de 7 meses: presentación de un caso clínico.)

By L. BENAVIDES. Ginec. Obstet. Mexico, 3,

129-138, Mar.-Apr. 1948. 3 figs.

1534. Double Ectopic Pregnancy in One Tube. [In English.]

By D. TROLLE. Acta obstet. gynec. scand., 27, 395-401, 1948. 9 refs.

1535. Tubo-ovarian Pregnancy in a Tuberculous Tubo-ovarian Cyst. (Grossesse tubo-ovarienne dans un kyste tubo-ovarien tuberculeux.)

By P. Burger. *Rev. franç. Gynéc.*, 43, 126–132, Apr. 1948.

### LABOUR

1536. Variations in Pulse and Arterial Blood Pressure During Uterine Contraction and their Relations to Myocardial Function. (Le variazioni del polso e della pressione arteriosa durante la contrazione uterina nei loro rapporti con la funzione miocardica.)

By A. PAVONI. Mon. ostet.-ginec., 18, 281-305,

July-Dec. 1947. 6 figs., 33 refs.

These investigations, carried out on 94 women in labour at the School of Obstetrics in Udine, are based on the consideration that a uterine contraction: (a) results in a reduction of the vascular surface area of the body and in the transfer of a larger amount of blood into the general circulation; (b) constitutes work; and (c) being painful, stimulates the vegetative nervous system.

During periods extending over four to five uterine contractions in the first stage of labour the pulse rate was registered for 15 seconds at intervals of 15 seconds, and the systolic and diastolic blood pressures were recorded at similar intervals. The patient's general condition, cardiac abnormality (if any), the dilatation of the uterine os. and the strength and duration of the uterine contractions were also noted. The author distinguishes between four types of results: (1) Normal. Just after the onset of a uterine contraction the pulse rate rises rapidly but soon gradually returns to normal. This coincides with an increase in the systolic blood pressure. The rise in blood pressure is in proportion to that of the pulse rate, and the extent of both depends on the intensity and duration of the uterine contraction. (2) Slight functional impairment. The rise in blood pressure and pulse rate is normal, and so is the relation between the two. The decrease in the pulse rate, however, is delayed. (3) Moderate impairment. There is a normal rise and fall in pulse rate. The rise in blood pressure, however, is delayed in its onset and reaches its maximum towards the end of, or even after, the uterine contraction. (4) Considerable impairment. This type is characterized by obvious disproportion between pulse rate and blood pressure. The former rises during a uterine contraction to heights quite out of proportion to the latter. There may also be an association with types (2) and (3). The author admits that in these investigations the problem has been approached from the point of view of haemodynamics and the functional state of the cardiac muscle only, and that extracardiac factorsconstitutional, endocrine, and neuro-vegative-N. Alders may influence the results.

1537. Critical Observation of Wolf's Concept of the Mechanics of Labour. (Kritische Betrachtungen zu W. Wolfs Geburtsmechanik.)

By G. Doderlein and G. Klumbies. Zbl. Gynäk., 69, 945-958, 1947. 4 figs., 11 refs.

1538. Roentgenographic Visualization of the Placenta in the Third Stage of Labor. A Preliminary Report.

By D. Robinson and W. S. Boyp. *Amer. J. Roentgenol.*, 58, 730-732, Dec. 1947. 1 fig., 12 refs.

The authors briefly review methods of placental visualization, and describe a technique for placental radiography in the third stage of labour. Amniography is mentioned and its dangers are stressed fit is curious that no reference is made to the danger of inducing premature labour]; cystography and soft-tissue radiography are briefly described, and there is a note on a series of 5 cases in which the placenta was accurately located by tomography. For the technique described the patient is delivered on a urological X-ray table and 20 ml. of "diodrast " is used as an opaque medium. The syringe is ready filled and the needle inserted into the umbilical artery as soon as the infant is born. When the operator is certain that the needle is in the artery the cord is severed and the diodrast injected.

Only one placentogram is shown, taken I minute after the injection, but the text states that further exposures are made at 3 and 5 minutes. There were no ill effects, and it is claimed that this method will aid in the diagnosis of placenta accreta and will increase knowledge of placentation. The X-ray factors quoted are 77.8 kV (peak), 15 mA, 2 seconds exposure, and 30-in. (75-cm.) target-film distance. Hugh R. Arthur

1539. The Immediate Postpartum Period as a Fourth Stage of Labor.

By C. T. JAVERT. Amer. J. Obstet. Gynec., 54,

1028-1032, Dec. 1947. 14 refs.

The author defines the fourth stage of labour as the interval from the expression of the placenta until complete reaction of the patient to the delivery, including a satisfactory contraction of the uterus without excessive bleeding. Its duration varies from the traditional hour to many hours if abnormal events occur. Twenty-eight of the 88 maternal deaths that occurred in the New York Lying-in Hospital from 1932 to 1945 took place during the fourth stage and were due to such causes as postpartum haemorrhage, cerebrovascular accidents, cardiac failure, anaesthesia, aspiration pneumonia, rupture of the uterus, and transfusion reactions. The clinical, anatomical, physiological, and pathological characters of the fourth stage are described. The events occurring in it should be recorded as a part of the history of labour, for it F. J. Browne is truly a part of labour.

1540. Medical Method of Assisting Normal Labour. (Méthode d'accouchement médical.)

By A. Badesco. Presse méd., 55, 780-781, Nov.

15, 1947.

A method of assisting normal labour is described. It consists in the intramuscular administration of methylene blue; 150 mg. in 3 per cent solution (freshly prepared and tyndallized at 60°C.) is injected during the first stage of labour when dilatation has reached 1 to 2 cm. The membranes are ruptured simultaneously, if the periods of rest between the pains are less than 2 minutes or if the pains are irregular in duration or intensity. In "pantopon" (papaveretum) is administered subcutaneously if uterine relaxation between pains is not complete. If the labour is not completed within 2 hours of the injection a further 100 mg. is administered. Of primiparae 23 per cent in 2 to 3 hours after injection, 46 per cent in 3 to 4 hours, and 8 per cent in 5 hours or more after injection (in the author's opinion delay in this last group is due to administering methylene blue too late). The author concludes that this is a valuable auxiliary measure in normal labour, especially in primiparae, when it is certain that there is no dis-The total duration of labour is materially shortened in all cases, and no deleterious after-effects either on the mother or on the baby Nicolas Tereshchenko have been noted.

1541. A New Method of Surgical Induction of Labour. (Nová metoda vyvolání porodních bolestí.)

By A. Lewi. Ceskoslov. Gynaek., 12, 478-482,

1947.

In cases in which labour has to be induced prematurely (thirty-second to thirty-sixth week) for reasons such as toxaemia, heart disease, pelvic contraction, the usual methods of medical and surgical induction often fail. In such cases (after artificial rupture of membranes and sometimes, if necessary, slight dilatation of the cervix) the author applies Willett's scalp-traction-forceps and attaches a weight of 300 to 500 g. This method brings on labour within 4 to 8 hours. The author has not observed any foetal or neonatal deaths or maternal complications attributable to this method [he does not, however, give any figures].

A. Rohan

1542. Induction of Premature Labour. (Parto prematuro artificial.)

By L. Alonso-Buena Posada. *Toho-ginec.* pract., 7, 150-172, Apr. 1948. 35 refs.

1543. The Significance of Cervical Dilatation in Trial Labour in Breech Presentations with Contracted Pelvis. (L'épreuve du travail sur le col au cours des accouchements en présentation du siège dans les bassins rétrécis.)

By —. RIVIÈRE, —. CHASTRUSSE, and —. MISSON. Rev. franç. Gynéc., 42, 303-310, Nov. 1947.

In discussing breech delivery in the presence of contraction of the pelvis, the authors emphasize the importance of the rate of dilatation of the cervix in prognosis. The behaviour of the cervix during labour is the best indication of the function of the uterus as a whole. Slow dilatation is an indication of poor action of the uterine muscle and thus a sign of dystocia. On the other hand, rapid dilatation is accompanied by powerful rhythmic contractions and a good outlook for spontaneous delivery.

This clinical study is based on 45 cases of breech presentation with contracted pelvis collected over 10 years from 1936 to 1945. From 1936 to 1942 Caesarean section was the rule and was performed in 15 cases out of 23. In all but 1 of these 15 cases the infant did well. The I foetal death was accounted for by multiple malformations. The 8 deliveries by the natural passages resulted in I foetal death due to cerebral haemorrhage after a difficult forceps delivery of the after-coming head. In 1943 and 1944 the patients were allowed to go into labour spontaneously. The course of labour was studied with particular reference to the rate of dilatation of the cervix. Of 16 cases, 9 ended in spontaneous delivery, 3 in extraction of the breech, and 4 in Caesarean section. In r of the cases in which extraction was performed, foetal death from cerebral haemorrhage resulted. In 1945 posterior pituitary extract was used when necessary to stimulate the uterus. In I case manual dilatation of the cervix and bringing down a leg resulted in successful delivery. The authors believe that the

behaviour of the cervix during labour should enable the obstetrician to decide when Caesarean section should be performed and when spontaneous delivery can be anticipated. [It is generally held that "trial labour" cannot be conducted in the presence of breech presentation, since the very essence of trial labour is that it is a test of the ability of the foetal head to pass through the maternal pelvis. Few obstetricians in Britain would embark on breech delivery in the presence of contracted pelvis unless the child was obviously small. This article would be more convincing if the observations had been reinforced by X-ray measurements of the pelvis. It appears also that no attempt at external version had been made in any of the cases described.]

Josephine Barnes

1544. The Effect of Thiamine Hydrochloride on the First and Second Stages of Labour. (El clorhidrato de tiamina y sus efectos en los períodos de dilatación y expulsion del parto.)

By J. H. Dubiau, O. Timmermann, and L. Geisse. Rev. méd. Chile, 75, 672-673, Oct. 1947.

The authors report the results in 21 patients of an intramuscular injection of 30 mg. of thiamine hydrochloride at the beginning of the first stage of labour, together with a similar dose at the beginning of the second stage. All patients had normal, or only slightly contracted, pelves. No other drugs were used. In 10 primigravidae the first stage averaged 6 hours 33 minutes and the second stage 40 minutes. [No control figures are given.] Forceps were used in 2 patients with small pelves and large babies. In another patient with a small pelvis manual dilatation of the cervix and internal version and extraction were carried out. In yet another patient a prolapsed cord was replaced and an oxytocic given. In II multigravidae with normal pelves the first stage averaged 4 hours 12 minutes and the second stage 11½ minutes. In I patient who refused the second injection the second stage lasted 75 minutes, and in another an oxytocic was required for a third stage lasting 30 minutes.

The authors believe that this drug shortens the first and second stages, and that there is less pain than usual and in some cases marked sleepiness. Uterine contractions are more powerful and regular, oxytocics are unnecessary, and no harmful effect on mother or baby has been found:

Bryan Williams

1545. Electric or Electro-drug Technique in Labour. (A propos de l'accouchement électrique ou électromédicamenteux.)

By C. Levasseur, M. Nordmann, and M. Chappuis. Gynécologie, 44, 177-208, July-Aug., 1947. 18 figs.

The authors describe the use of a sinusoidal electric current with the object of accelerating the course of labour. Patients chosen were in normal

labour, or labour capable of being made normal, with the presenting part engaged. Treatment was begun when the cervix was about 4 cm. dilated in primiparae and about 2 cm. dilated in multiparae. In addition an injection of "solution 5" (1 unit of posterior pituitary extract, 20 mg. of opium extract, 30 mg. phenobarbitone) or of "solution 12" (1 unit of posterior pituitary extract, I g. magnesium hyposulphite, 10 mg. "eucodal") was given. An attempt was made to dissociate the action of the three and the results are given under four headings: (1) Twelve observations where electricity was used without injection of either solution, or artificial rupture of the membranes. (2) Five observations after injection of "solution 12". (3) Four observations after injection of "solution 5". (4) Four observations in which, after psychological preparation of the patient, the electrical apparatus was applied without turning on the current. Two methods of study were used. Uterine contractions were recorded by the uterotensometer. The "curve of dilatation" of Vignes and Breil was plotted to observe the effect on the rate of dilatation of the cervix. The results from the use of electricity alone showed that in 6 dilatation appeared to be accelerated. In I case the normal course of labour was accelerated, while in another it appeared to be retarded. The authors conclude that patients exhibit an individual sensitivity to the effect of the electric current. The general conclusion is that the solutions were more effective than the electric current. The best results were obtained by a combination of electricity and injections. The value of psychological suggestion is stressed.

The small number of observations in each of the four groups makes the value of these doubtful, since it is well known how variable the course of labour may be even in normal women. It is interesting to note that a good effect was obtained when the electrical apparatus was used without turning on the current.] Iosephine Barnes

1546. Leading Considerations in the Problem of Active or Conservative Management of Labour. (Wytyczne uwagi w sprawie czynnego i zachowawezego postepowania w czasie porodu.)

By K. Bochenski. Przeg. Lek., 3, 756-762, Nov. 1947.

1547. Spontaneous Rupture of the Uterus During Dystocia Due to Fibroid in Pelvis. (Rotura espontánea del utero y vejiga en parto distócico por fibroma uterino previo.)

By F. Perez Acosta. Rev. méd.-quirurg. Oriente, 9, 10-18, Mar. 1948. 2 figs., 5 refs.

1548. Dystocia and Monsters. (Distocias monstruos.)

By F. M. FERRER. Rev. esp. Obstet. Ginec., 7, 93-102, Mar.-Apr. 1948. 2 figs.

1549. The Course of Labour in Congenital Dislocation of the Hip. (Geburtsverlauf bei angeborener Hüftgelenksluxation.)

By F. RENDELSTEIN. Klin. Med. Wien., 3, 293-

297, Apr. 15, 1948. 3 refs.

1550. Abnormal Presentation.

By H. H. WARE. J. Amer. med. Ass., 137, 448-450, May 29, 1948. 5 refs.

1551. Shoulder Delivery in Cephalic Presentation. (Skulderløsning ved hodefødsel.)

By J. Lovset. Nord. Med., 38, 1127-1128, June 4, 1948. I fig.

Prognosis in Breech Delivery with Special Reference to Application of Forceps to the Breech. (Sulla prognosi ed il trattamento del parto podalico con particolare riguardo alla varieta' natiche e all'applicazione del forcipe sul podice.)

By Niosi-Cusimano. Mon. ostet.-ginec., 18, 169-

189, July-Dec. 1947. 41 refs.

The author reports on 146 breech deliveries at the Obstetrical and Gynaecological Clinic of the University of Pisa. In 59 cases (40.4 per cent; surgical intervention proved necessary. In 13 cases Kielland's forceps was applied to the presenting breech without foetal mortality or serious maternal morbidity. The indications for intervention were foetal distress, uterine inertia, and maternal eclampsia.

[The (corrected) foetal mortality in the author's series of breech deliveries is 6.6 per cent-hat is, I in 16. A foctal mortality of nil in his I cases of breech delivery by forceps is, therefore, satistically insignificant. While this method has had its place in operative obstetrics, ever since Levet applied the forceps to a breech, mistaking it for the head, almost 200 years ago, it is not likely to alter materially the foetal mortality in breech deliveries, since the really dangerous procedure is N. Alders delivery of the head.]

1553. Opisthotonos Fetalis in Breech Presentation. Report of a Case with Bilateral Congenital Posterior Dislocation of the Tibiae.

By G. F. Melody. Calif. Med., 68, 378-380, May 1948. 4 figs., 12 refs.

1554. Face Presentation.

By S. J. RUDOLPH. Amer. J. Obstet. Gynet.,

54, 987-993, Dec. 1947. 1 fig., 1 refs.

At the Philadelphia Lying-in Hospital there were 61 face presentations in 35,163 deliveries—that is, 1 in 576. Faulty position of the uterine axis, usually given as a cause, was not blamed in any of the The malpresentation was about equally common in primiparae and multiparae. In 11 of the 29 primiparae and 7 of the 32 multiparae some form of pelvic abnormality was present. Twentyfive of the infants were over 8 lb. (3.6 kg.) in weight, and in almost half the cases there was

disproportion, either due to contracted pelvis or to the size of the child. In one case the cord was three times round the foetal neck. Seven infants (II per cent) were monsters—5 anencephalics and 2 cases of acraniorachischisis. There was only I case of placenta praevia. There were no maternal deaths, but the foetal and neonatal mortality (19.7 per cent) was nearly 4 times the average for the hospital. This, however, included the 7 monsters and an infant weighing under 2 lb. (0.9 kg.).

According to the textbooks the incidence of the various positions in cases of face presentation is closely correlated with the incidence of the vertex position, to which they correspond—that is, 85 per cent right mento-posterior and left mento-anterior. In this series, however, there was an almost equal distribution between left and right mento-anterior and left mento-posterior positions. A right mentoposterior position occurred only 4 times. Of the mothers 19 were delivered spontaneously, and 16 were delivered by forceps without rotation. Internal podalic version was required in 14 cases, and Caesarean section in 8. Rotation and forceps delivery were necessary in 4. The duration of labour for both primiparae and multiparae was far below the average. The author concludes that the majority of patients in cases of face presentation can be safely delivered spontaneously or by low forceps, while Caesarean section is safest if there F. J. Browne is disproportion.

1555. Manual Removal of the Placenta.

By R. W. DEVOE and A. B. HUNT. West. J. Surg. Obstet. Gynec., 55, 647-650, Dec. 1947. 5 refs.

Manual removal of the placenta has always been attended by considerable risk. In 1928 a mortality rate of 10 per cent was recorded by Bumm, and in 1937 a corrected mortality rate of 2.6 per cent with a morbidity rate of 31.5 per cent was recorded by Block. In recent years both mortality and morbidity rates have been considerably lowered by increasing care in asepsis and by chemotherapy. The present study is based upon the results of the procedure carried out in 98 of the 6,753 obstetric patients treated at the Mayo Clinic between the years 1936 and 1945. The usual technique was employed in all cases; in 70 per cent the uterine cavity was subsequently packed with gauze. One patient died, and the morbidity rate in cases where the operation was performed early was 4.4 per cent. In 9 cases of the series, optimal conditions were not present and the morbidity rate rose to 7.7 per The authors hold strongly that manual removal of the placenta, performed under the best conditions, should not be carried out only as a last resort in the treatment of postpartum haemorrhage. They believe, with Pastore, that the early and proper use of the method in cases of progressive postpartum haemorrhage will reduce the incidence of postpartum complications. Moreover, the pro-

cedure is indicated in cases not associated with excessive blood loss, in which the placenta has been retained for at least an hour after the expulsion of the infant.

Falkland L. Cary

1556. The Actiology, Prevention and Treatment of Retained Placenta.

By K. M. D. HARDING. Med. Press, 219, 457-458, May 26, 1948.

1557. Spontaneous Formation of a Haematoma during Labour. (Spontanhämatombildung unter der Geburt.)

By R. Gerlach. Zbl. Gynäh., 69, 973-974, 1947.

1558. "Pervitin" ("Methedrine") Treatment of Intrauterine Asphyxia. (Die Pervitintherapie der intrauterinen Asphyxie.)

By A. ROCKENSCHAUB. Wien. klin. Wschr., 59.

797-799, Dec. 5, 1947. 2 figs., 15 refs.

The author points out that impending intrauterine asphyxia is often the reason for intervention during labour, and that until 1941 the only method of saving the foetus was by application of forceps if the cervix was fully dilated or by Caesarean section if asphyxia occurred early in labour. In 1941 Nevinny recommended the intravenous injection of "cardiazol" (leptazol) and Froewin a little later suggested the use of "pervitin" ("methedrine ") by mouth, the idea being to improve the circulation and tone of the heart muscle and hence increase the rate of blood flow in, and absorption of oxygen from, the placenta. Statistics are given for three groups of cases. (1) Untreated: 56 cases of intrauterine asphyxia; 8 infants were not asphyxiated at birth while 48 were asphyxiated (28 being dead). (2) Treated with cardiazol: 46 cases of impending asphyxia were treated, and 24 infants were born asphyxiated, 11 being dead. (3) Treated with methodrine: 62 cases; only 11 infants were born asphyxiated, 4 being dead. In all groups it will be noted that one-half of the foetuses born asphyxiated were dead. The cause of death in the majority was a tentorial tear or aspiration of liquor amnii. The frequency of forceps delivery for foetal distress was reduced considerably—with cardiazol treatment it was only 45 per cent of the previous rate and with methodrine treatment only 18 per cent. Gladys Dodds

1559. Fatal Obstètric Shock and Phaeochromocytoma. (Choc obstètrical mortel et paragangliome hypertensif de la surrénale.)

By L. DIGONNET, J. THOYER-ROZAT, B. DUPERRAT. Gynéc. et Obstét., 46, 677-682, 1947.

2 figs., 5 refs.

A description is given of a case of fatal obstetric shock due to an associated phaeochromocytoma (chromaffinoma, paraganglioma) of the right suprarenal. The patient, a 3-gravida, had typical attacks of intermittent hypertension during her second pregnancy. When seen during her third

and last pregnancy she had persistent hypertension without albuminuria or oedema. The patient became gravely shocked 2½ hours after spontaneous delivery. This state of shock responded to treatment but recurred after 36 hours and proved fatal. At necropsy, a phaeochromocytoma of the right suprarenal was found with considerable haemorrhagic necrosis of the tumour substance. All other organs, including the kidneys, pituitary, and placenta showed no pathological change. The author suggests that the necrosis of the tumour may have some bearing on the production of shock.

D. M. Sheppard

#### ANAESTHESIA

1560. Analgesia and Anaesthesia in Obstetrics. (Analgésie et anesthésie obstétricales.)

By F. DE SENARCLENS. *Praxis*, 37, 306-308, Apr. 29, 1948.

1561. Combined General and Local Anesthesia for Vaginal Delivery.

By E. A. GRABER and S. DRUCE. N.Y. St. J. Med., 48, 1269-1270, June 1, 1948. 4 refs.

1562. Nitrous Oxide Anaesthesia in Gynaecology and Obstetrics. (Uber die Stickoxydulnarkose in der Gynäkologie und Geburtshilfe.)

By G. IMHOLZ. Geburtsh. u. Frauenhoilk., 8, 385-396, Apr. 1948. Bibliography.

1563. Sodium Pentothal Anesthesia for Selected Vaginal Obstetrics.

By A. L. Dippel, R. J. Helman, C. E. Wolters, H. A. Wall and F. H. Hairston. Surg. Gynec.

Obstet., 85, 572-582, Nov. 1947. 13 refs. In the division of obstetrics at the Hermann Hospital, Texas, intravenous "sodium pentothal" anaesthesia was introduced in the 1939-45 war because of the shortage of anaesthetists for routine work. Before this all deliveries had been effected with perineal block analgesia. The properties and action of sodium pentothal are described, and it is stated that this drug passes rapidly into the foetal circulation and reaches equal concentration in foetal and maternal blood in 10 to 12 minutes. Pentothal has a markedly depressant effect on the respirations of the baby. Maternal contraindications to the use of pentothal are heart disease and the possibility of respiratory obstruction. Toxaemia should be a contraindication, but no adverse effects were observed in that condition. Between July 1945. and October 1946, 350 patients were delivered under pentothal anaesthesia. Administration of the drug began only when a rapid delivery was anticipated. A 2 per cent solution of sodium pentothal was injected slowly until the patient stopped counting, when a further 5 ml. of solution was given. Further amounts were injected if the patient showed evidence of wakening. The cord was clamped immediately after delivery to avoid further transference of the drug to the baby.

Pentothal did not affect the uterine action, and there was no increase in blood loss. In 89.5 per cent of cases no special resuscitative measures were required for the baby, but in 10.5 per cent resuscitation was necessary. The authors conclude that sodium pentothal anaesthesia, while carrying no special advantages, when used carefully carries no special risk for the mother or baby. Many tables of statistics are given referring to this group of patients.

[This article contains a bewildering mass of statistics (17 tables in all). It is difficult to draw any conclusions; the practice of obstetrics at this centre is different from that in Britain in that every patient appears to have complete anaesthesia for delivery and the forceps rate is extremely high.]

L. W. Lauste

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D. M. Stern

1564. Sodium Pentothal Anesthesia in Obstetrics. By C. L. COOLEY and H. F. SCHWARZ. West J. Surg. Obstet. Gynec., 56, 278-284, May 1948. 3 refs.

1565. Low Spinal Nupercaine Anesthesia in Obstetrics.

By H. E. SCHMITZ and G. BARA. Amer. J. Obstet. Gynec., 54, 838-847, Nov. 1947. 12 1efs.

Before administration of "nupercaine" every patient was tested for sensitivity. Penneal analgesia usually lasted for more than 3 hours; where longer analgesia was desired more than one dose was given. Injection was given late in the first stage or early in the second stage of labour, the dose being up to 2 ml. of a 5 per cent glucose solution containing 2.5 per cent nupercaine per ml. Some untoward effects occurred—fall in blood pressure, foetal bradycardia, and headache. The following is the authors' table of results:

Total number of low spinal cases ... number with complete Total subjective relief for at least 1 hour Cases with complete relief with 328 one injection Cases with complete relief with 31 two injections Cases with complete relief after 23 each of two injections Cases with incomplete relief with first but complete after 5 second injection Cases with complete relief with first but incomplete with second injection Total number of incomplete relief cases ... Cases with incomplete relief after` 12 one injection ... Cases with incomplete relief after each of two injections

Total number of complete failures ...

#### **PUERPERIUM**

1566. The Physiological Maternal Blood Picture in the Puerperium. (Das physiologische mütterliche Blutbild im Wochenbett.)

By —. ARNETH. Zbl. Gynäk., 69, 974-977, 1947. 9 refs.

1567. Advantages of Early Ambulation after Confinement. (Les avantages du lever précoce après l'accouchement.)

By R. Keller and A. Ginglinger. Gynéc. et Obstét., 47, 310-312, 1948.

1568. Classification of Puerperal Disease. [In Russian.]

By S. B. RAFALKES. Akush. Ginek., No. 1, 43-47, 1948.

1569. The Problem of Rational Classification of Puerperal Disease. [In Russian.]

By A. V. BARTELS. Akush. Ginek., No. 1, 47-54, 1948.

1570. The Causative Organisms of Puerperal Infections and their Specific Therapy. (Uber die Erreger puerperaler Infektionen und deren kausale Therapie.)

By P. Bernhard. Zbl. Gynäk., 69, 882-897,

1947. 19 refs.

Bacteriological examination revealed anaerobic pathogens in 52 of 104 women suffering from puerperal infection. Gas-gangrene organisms were found in 46.2 per cent of cases and anaerobic streptococci in 6.7 per cent. In only 8.6 per cent of all cases was infection due to a single organism, while in 91.4 per cent there were mixed infections with 2 to 7 different organisms. Since efficient chemotherapeutic agents must act on both aerobic and anaerobic bacteria, the author considers the combinations "de-ma" ("debenal" or sulphadiazine with "marbadal", which is a "marfanil" derivative) and "supronal" (sulphamerazine with marbadal) to be more suitable for the treatment of puerperal infections. The mixture de-ma has given the best results to date.

1571. The Conquest of Puerperal Infection 1846-1946.

By E. S. BRACKETT. Rhode Island med. J., 31, 235-239 and 246, Apr. 1948.

1572. Uterine Gangrene Among 7,500 Deliveries. (Gangrena uterina.)

By R. Pumarino. Bol. trim. Hosp. Vina d. Mar., 4, 41-44, Apr. 1948. 3 refs.

1573. Anaerobic Micro-organisms in Puerperal Infection. [In Russian.]

By S. G. Yurevski. Akush. Ginek., No. 1, 32-35, 1948.

1574. Penicillin and Pregnancy. (Pénicilline et grossèsse.)

By A. Khoury. C. R. Soc. franç. Gynéc., 18, 86-88, Mar. 1948. 2 refs.

1575. Use of Penicillin in the Treatment of Puerperal Infection. [In Russian.]

By E. A. MOGNYAN. Akush. Ginek., No. 1, 37-38, 1948.

1576. Penicillin Treatment of Retained Placental Fragments in the Late Puerperium. (Penicillinbehandlung bei Plazentaresten in Spätwochenbett.)

By H. TISCHER. Klin. Med., Wien, 3, 309-316, Apr. 15, 1948. 3 figs., 13 refs.

1577. Application of Penicillin Therapy in Obstetrics and Gynaecology. [In Russian.]

By I. I. ZEMLINSKAYA. Akush. Ginek., No. 1, 39-40, 1948.

1578. Puerperium Complicated by Uterine Tumour. (Un caso de puerperio complicado por tumor uterino.)

By R. HORNO LIRIA. Rev. esp. Obstet. Ginec., 7, 107-112, Mar.-Apr. 1948. 2 figs., 5 refs.

1579. Postpartum Eclampsia Supervening Later than Three Days after Delivery.

By H. Acosta-Sison. J. Philippine med. Ass., 24, 115-117, Mar. 1948. I ref.

#### LACTATION

1580. Lactation in the Light of the Latest Investigations. (Wydzielanie mleka w świetle najnowszych badan.)

By A. Kelhoffer. Przeg. Lek., 3, 532-536, Aug.

15, 1947.

The literature on recent investigations into hormonal and neuropsychic factors in lactation is reviewed. The author describes his own experience in the treatment of 24 cases of failure of lactation with "suppletan". Suppletan was first manufactured as an ointment for local application and contained prolactin (100 pigeon units in 20 g.), oestrone, cod-liver oil, "vaseline", and "lanolin". Recently, however, it has been produced as a suppository and it was in this form that the author employed it. The treatment failed when it was started on the sixth day or later. One suppository was used twice daily for a period of 5 days. In 2 cases there was no response; in the others the breasts again became congested and there was a three-fold to four-fold increase in milk yield. In 2 cases this increase was maintained; in the rest the milk yield fell but remained twice as high as it was before treatment. C. Uhma

1581. Effects of Gonadotrophic Hormones on Lactation.

By G. M. C. Masson. *Proc. Soc. exp. Biol.*, N.Y., 66, 506-508, Dec. 1947. 1 fig., 15 refs.

The inhibiting effect of steroids on lactation is mediated through the ovaries and is probably due to the hormonal secretions of the large corpora lutea formed under the influence of the steroids. Since the ovaries are normally stimulated by

gonadotrophins of pituitary or chorionic origin, it was decided to investigate the effect of these hormones on lactating rats. Similar groups of albino rats with 6 young in each litter were studied from the day after parturition until necropsy, which was performed on the seventeenth day or earlier if all the litter died. Criteria of efficiency of lactation were provided by the growth curves of sucklings and by the number of deaths among the young. Mammary glands and genitalia were carefully investigated histologically after death. The influence of anterior pituitary preparations and of varying dosage of chorionic gonadotrophin and pregnant mare serum was studied. Pregnant mare serum strongly inhibited lactation and caused the death of most of the young. Chorionic gonadotrophin had a slight effect on the growth curve of the young, while an anterior pituitary preparation was inactive. From histological studies of the ovary, vagina, and uterus, it is suggested that the activity of pregnant mare serum is due to a high level of oestrogens and progesterone.

Doreen Daley

#### THE INFANT

1582. The Physiological Loss of Weight in the Newborn Infant and an Attempt at the Prevention of this Loss. (Fysiologicky übytek váhovy u novorozencu a vliv prevence tohoto váhového spádu.)

By J. STRUMA. Ceshoslov. Gynaek., 12, 411-

422, 1947. I fig.

All babies born in 1946 at the Second Obstetric Clinic of Prague University received 3-hourly during the first 24 hours (starting 12 hours after birth) 15 to 20 g. of fluid consisting of equal parts of Ringer's solution and sweetened tea. The initial weight loss of these babies was compared with that of all babies born in 1945, when no special precautions had been taken. The author found that there was no significant difference in favour of the 1946 group; babies whose initial weight was low lost significantly more weight under the special regime. It is concluded that the initial weight loss is, in fact, physiological, and special measures to prevent it are unnecessary and futile. Any loss beyond the physiological maximum of 10 per cent, however, A. Hohan must be combated.

1583. Physiological Oedema of the Newborn-(Edema fisiológico del recién nacido.)

By R. ORTHEGA and O. JIMENEZ. Rev. chil. Pediat., 18, 843-854, Nov. 1947. 3 figs., 14 refs.

1584. The Coronary Arteries of Infants.

By W. L. MINKOWSKI. Amer. J. med. Sci., 214,

623-629, Dec. 1947. 1 fig., 21 refs.

The author, at the Beth Israel Hospital, New York, examined histologically sections of coronary arteries of 122 male and 82 female infants. The vast majority were stillborn or less than one week

old. The literature is reviewed, with particular reference to the investigations of Dock (J. Amer. med. Ass., 1946, 131, 875). Intimal changes, such as the presence of a musculo-elastic and/or elastic layer, were found in 60 per cent of male and 51 per cent of female infants.

To study the influence of sex on these coronary changes the author selected a group of 51 males and 25 females not more than I day old in whom the cause of death was either birth injury or asplivxia. He estimated the intima: media ratio of the coronary arteries, and found that the mean difference between male and female was significant. Of the male infants 43 per cent showed varying degrees of intimal thickening compared with 35 per cent of females. Intimal changes were found often in older infants and children in whom death had followed bronchopneumonia or other infection. Whatever the significance of the sex difference in thickness of coronary intima and whatever the importance of bacterial or other toxins in the production of these changes, the true meaning of their findings and their relation to adult atherosclerosis and the so-called early adult arteriosclerotic lesion, constitute, according to the author, still A. I. Suchett-Kaye unsolved problems.

1585. Glomerular Filtration Rate, Effective Renal Blood Flow, and Maximal Tubular Excretory Capacity in Infancy.

By J. R. West, H. W. Smith, and H. Chasis. J. Pediat., 32, 10-18, Jan. 1948. 4 figs., 17 refs.

The authors, at the New York University College of Medicine, discuss the development of glomerular and tubular function in children up to 2 years of age, renal function being correlated with body surface area.

In 23 normal infants estimations were made, by the methods described by Goldring and Chasis for adults, of: (1) mannitol clearance (rate of glomerular filtration), (2) p-aminohippurate clearance (effective renal plasma flow), and (3) maximal tubular excretory capacity for p-aminohippurate. Both substances were administered in doses varying with body weight to give suitable plasma concentrations in an intravenous normal saline infusion (250 ml. at 2 to 4 ml. per minute), with a second dose of p-aminohippurate after 30 minutes. After a further 30 minutes urine was collected by catheterization, the bladder being washed out with sterile saline after each collection. In later tests the mannitol was determined by the chromotropic-acid method of Corcoran and Page.

The authors found that the filtration rate increases from 3 ml. per minute in the first week of life to 40 to 50 ml. per minute at 1 year. From their data the correlation between renal function and body surface area appears to exist at ages under 2 years, the adult filtration rate of 124 ml. per 1.73 sq. meters being reached in some infants at the age of 10 to 20 weeks. The renal plasma flow

increased from 12 ml. per minute in the first week to 140 ml. per minute at 1 year. The adult mean (646 ml. per 1.73 sq. metres) was reached by 30 weeks in some cases. The maximal tubular excretion of p-aminohippurate increases from 2.6 mg. a minute to 25 mg. a minute, and reaches the adult value at 30 weeks (77.5 mg. a minute per 1.73 sq. metres). It is concluded that these three functions are adjusted before the age of I year to the metabolic requirements of the body, for which the surface area is taken as an index, but that in early infancy the adjustments take place at different rates. Examination of the various ratios shows: (1) A proportional increase in renal blood flow with the development of the renal tubules. (2) A high filtration fraction in early months, due either to imbalance between glomerular and tubular development or to a low extraction ratio in the blood perfusing the tubules—a point which requires further study. The authors suggest that the preponderance of glomerular function over tubular function may be due to the large glomerular surface and increased pressure found in the infant Morag L. Insley kidney.

1586. Cardiac Murmurs in Infancy.

By N. Cox. Brit. med. J., 1, 148-150, Jan. 24,

1948. 7 refs.

In a preliminary report on the significance of cardiac murmurs in infancy the authors record their observations on 630 ostensibly healthy children examined at the ages of about 6 weeks, 3, 6, 9, and 12 months, and thereafter at 6-monthly intervals, most of them for about 3 years. Regular 6-monthly radiographic examinations were made in all children. Thirty-two (5 per cent) had murmurs which were classified according to the age when first noticed and are described as transient, temporary, or persistent. No diastolic murmurs were observed. Of the 32 murmurs 23 were not detected until after the child was 9 months old. There was a relatively greater number of transient murmurs among infants observed in the early weeks of life. Six out of 8 murmurs appearing at the age of 18 months remained permanent. With the exception of 2 cases, no associated symptoms or signs could be observed. No correlation between clinical findings and radiographic appearances could be established. The results are as yet too few to allow any conclusions to be drawn. H. Herlinger

1587. The Function of Vernix Caseosa in the First Days of Life of the Newborn Infant. (Funkcia plodového manu v prvych dzoch života novorodenca.)

By E. Dinos. Ceskoslov. Gynaek., 12, 399-410,

1947. 3 figs., 7 refs.

Stimulated by observation of an epidemic of pemphigus neonatorum which was brought under control after the daily bath had been discontinued, the author compared the findings in 300 babies whose vernix caseosa was left and rubbed into the skin, and in an equal number of babies given as

usual daily baths. The effect on the initial loss of weight, body temperature, icterus, and skin affections was noted. The lowest body weight was reached 3.76 days after birth in the experimental group and 4.05 days after birth in the control group. A higher percentage of controls (4 per cent) lost over 15 per cent of their birth weight; in the experimental group 1.3 per cent lost this amount. Temperatures from 37° to 38°C. (98.6° to 104.4°F.) were recorded in 65 per cent of the controls against 27.66 per cent of the babies whose vernix was not removed. The incidence of icterus was higher in the experimental group (33 per cent against 22.33 per cent); but skin affections were found in only 1.66 per cent of the unbathed babies against 9.63 per cent of the controls. This last finding is explained by the fact that the vernix caseosa protects the skin against drying, fattens it, changes its pH towards acidity, and supplies biologically important material, mainly sulphur. In vitro experiments did not, however, show any bactericidal or bacteriostatic activity of the vernix. From these observations and from data found in the literature the author recommends preservation of the vernix caseosa, especially in premature babies.

A. Rohan

1588. Premature Closure of the Cranial Sutures. By D. R. SIMMONS and W. T. PEYTON. J. Pediat., 31, 528-547, Nov. 1947. 5 figs., 54 refs.

Various surgical procedures, mostly unsuccessful in altering the patient's ultimate disability and often attended by a considerable mortality rate, have been described for the treatment of craniostenosis in its various forms. Many disappointments have been due to failure to recognize the fact that the patients suffered from microcephaly with mental retardation but without signs of raised intracranial pressure, and were not cases of true craniostenosis. The growth of the cranium is dependent on, and normally keeps pace with, the growth of the brain, which has practically reached its adult size by the age of 3 years. Early closure of sutures after this age will result in alteration in shape of the skull but will have little effect on mental development, whereas if it occurs earlier and the brain is growing normally papilloedema, visual impairment, mental retardation, epilepsy. headache, and other signs of increased intracranial pressure develop. In typical oxycephaly (pointed skull), exophthalmos and divergent squint due to shallow orbits and divergence of the visual axes occur also. Commonly associated congenital abnormalities, such as syndactyly and mongolism, argue in favour of the theory that an inherent defect in the germ plasm is a cause of this condition. There is also a distinct tendency for it to be familial and inherited.

The authors stress the fact that clear signs of increased intracranial pressure occur late in the condition, and that optic atrophy is also a late sign

and secondary in most cases to papilloedema. The optimum time for successful surgical treatment is before cerebral damage occurs. Retardation of mental development may be recognized in the early. months of life and the authors consider this to be the indication for surgical intervention in a patient with a skull deformity and radiological evidence of synastosis. [It is difficult, however, to see how the cases of the microcephaly with early closure of sutures can be differentiated.]

Subtemporal decompression and various other operations have been designed for the relief of craniostenosis. Linear craniectomy—that removal of strips of bone along the prematurely synastosed sutures—has given promising results, especially in young infants, whose skull bones are thin and flexible. On the other hand bridges of bone tend to occur across the artificial sutures, and expansion of the skull is thus arrested. The authors describe a method of interposing tantalum foil between the bone edges to prevent this regeneration. In older children with thick skulls the multiple groove method known as morcellation is preferable, and in adults with visual disturbances and headache subtemporal decompression is recommended. Decompression of the optic canal is not generally indicated but may be considered in certain cases in which direct pressure on the optic nerves may be suspected or in which decompression has failed to arrest progressive loss of vision.

M. Baber

1589. Duration of Pregnancy and Birth Weight. (Schwangerschaftsdauer und Neugeborenengewicht.) By H. A. Hosemann. Arch. Gynäk., 176, 109-123, 1948. 6 figs., 20 refs.

1590. Duration of Pregnancy and Size of Foctus at Birth. (Schwangerschaftsdauer und Neugeborenengrösse.)

By H. A. Hosemann. Arch. Gynäk., 176, 124-134, 1948. 4 figs.

1501. The Etiological Factors of Asphyxia Neonatorum.

By R. L. MEANS. J. Bowman Gray Sch. Med., 6, 48-53, Apr. 1948. 31 refs.

1592. The Pathogenesis of Congenital Polycystic Lung and its Correlation with Polycystic Disease of other Epithelial Organs. Reconstruction of Cystic Elements in Two Cases.

By R. F. Norris and R. M. Tyson. Amer. J. Path., 23, 1075-1097, Nov. 1947. 9 figs., 35 refs.

Two cases of congenital cystic disease in newborn infants are described. In the first the rightlung was enlarged by cysts. These did not communicate with the bronchus, the immediate branches of which ended abruptly. The cysts and the connected alveoli were filled with fluid. The lung also contained isolated bronchial tubes which were not dilated and which were connected with atelectatic alveoli. In the second case there was a

large cyst in the left upper lobe. The left upper lobe bronchus ended blindly and the cyst had no alveolar connexions. In the left lower lobe the small bronchi showed irregular sacculations with abnormal alveolar communications. The authors have written a series of articles on cystic disease in other organs and they discuss its pathogenesis. The degenerative process which leads to isolation and cyst formation in the more distal parts of the developing bronchial tree they designate "segmentation". They are uncertain whether in cystic disease of the lung there is an excess of bronchi and whether the cysts represent a persistence of embryonic bronchi which normally are resorbed. They also raise the question of deficiencies of the circulation in the origin of the condition. [A thesis entertained by the abstracter.] A vascular anomaly was possibly responsible for the large cyst in the second case, in which the heart and large vessels were transposed. D. M. Pryce

1593. Medullary Malformation in a 25 mm. Embryo, and its Importance in the Pathogenesis of Hereditary Ataxia. (Malformación medular de un embrión de 25 milimetros, y su importancia en la etiopatogenia de la heredo-ataxia.)

By F. ORTS LLORCA and M. M. MARTINEZ. Rev. clin. esp., 28, 40-44, Jan. 15, 1948. 7 figs., 15 refs.

The embryo examined and studied by the authors showed a severe malformation, mainly abnormal shape of the cord, the dorsal part of which was adherent to the perimedullary tissues. This had prevented the normal development of the tracts of Goll and Burdach. The perimedullary space was completely absent; the meninges, too, were malformed. The authors believe that similar lesions would produce later on clinical pictures of status dystrophicus and Friedreich's hereditary F. K. Kessel ataxia.

1594. Congenital Malformations Induced in Rats by Maternal Vitamin A Deficiency. II. Effect of Varying the Preparatory Diet upon the Yield of Abnormal Young.

By J. WARKANY and C. B. ROTH. J. Nutrit.,

35, 1-11, Jan. 1948. 4 figs., 9 refs.

Warkany and Schraffenberger reported congenital anomalies of the eyes in the offspring of rats depleted of vitamin A. Since the rate of fertility was low in the original experiments and the yield of abnormal offspring small, modifications of the preparatory diet were studied.

Female rats were placed on the preparatory diet (diet U): ground whole wheat, 74 per cent; crude casein, 15 per cent; brewers' yeast, 10 per cent; sodium chloride, I per cent. According to the supplements added to this diet the animals were divided into four groups: Group I: diet U with 2 g. of frozen horsemeat daily and  $4\mu g$ . of carotene every tenth day was given to 165 females until mating occurred, then replaced by diet W. Group II (34

females): diet U daily with 12µg. of carotene every tenth day; Group III (33 females): diet U daily with 25 µg. of carotene every tenth day; Group IV (28 females): diet U daily with 25 µg. of carotene every tenth day during the first month; in the following month a loss of weight was observed and therefore the carotene intake was doubled during the last 2 weeks of the fertility period. Groups II, III, and IV were placed on diet W. upon reaching maturity and attempts were made to breed from them after the change. Diet W was a purified diet completely free from vitamin A and carotene, with small measured amounts of the other vitamins added.

When early termination of pregnancy threatened the foetuses were removed. When the young were carried to term foetuses were removed on the twenty-second day of gestation. Many young thus removed were alive but none could be reared. The eyes of at least 1 animal in each litter were sectioned scrially. If no retrolenticular membrane was found the animal was considered normal, but if a membrane was seen in any section the animal was regarded as abnormal. When the eyes of one foetus in a litter were found to be abnormal the entire litter was considered and counted as abnormal. This method of classification appeared to be justified.

Of 260 females 22 had cycles but did not mate; 124 mated but had no issue; 114 had litters but only 30 of these litters were carried to term; 80 litters were considered abnormal and 25 normal. These litters consisted of a total of 820 young, 612 of which were regarded as abnormal and 208 as normal. Other ocular defects were seen in many of the eyes sectioned. A number of litters showed external changes not observed in control animals -smallness of size, "convex" back, "open eyes", puffiness of hands and feet. In many foetuses with abnormal eyes serial section of the trunk and abdomen revealed various congenital anomalies of the soft tissues. Abnormalities of the same type were seen in all four groups. In Groups I and II there were the lowest fertility rate and the highest incidence of abnormal young; Group IV had the highest fertility rate and the lowest incidence of abnormal young. In 80 females used as controls, no abnormalities were seen in litters.

It is concluded that variations in the preparatory diets influenced the proportion of abnormal young.

\*\*Joseph Parness\*\*

1595. Congenital Ocular Anomalies Resulting from (a) Premature Birth (b) Rubella Infection of Mother During Pregnancy.

By W. R. BUFFINGTON. New Orleans med. Surg. J. 100, 466-470, Apr. 1948.

1506. Radiological Features of Anencephaly. (Aspecto radiológico das anencefalias.)

By H. Costa. An. brasil. Ginec., 13, 189-194, Mar. 1948. 3 figs., 11 refs.

1597. Further Observations on Congenital Malaria. (Weitere Beobachtungen zur Frage der angeborenen Malaria.)

By A. Eckstein. Ann. paediatr., Basel, 169,

381-403, Dec. 1947. 2 figs., 8 refs.

The author reports 4 cases of congenital malaria, which raise the number of similar cases observed by him to 18. The difficulties in diagnosis of congenital malaria are mainly due to the peculiarities of the course of malaria in the neonatal period and in early infancy. Many workers consider that the diagnosis of congenital malaria is justified only when the parasites are found in the blood of the umbilical cord of the infant during the first days of life. This concept, based on the assumption of a fixed incubation period, is not accepted by the author, since a long incubation period may delay for months or even years the appearance of definite signs and symptoms. For this reason the following three points are considered important in the diagnosis: (1) The mother must be suffering from malaria. Of particular importance are attacks during the last few months of pregnancy or immediately before or during labour. plasmodia of mother and child must be of the same variety. (2) Presence of plasmodia in the blood of the infant during the neonatal period or during infancy, together with symptoms of malaria, with special regard to the clinical forms which are characteristic of infancy and which have been previously described by the author. (3) The infant must be living under conditions which exclude the possibility of a postnatal infection. This exclusion is usually possible during periods when the average temperature is below 15°C. and development of the parasites in the mosquito consequently stops. This last condition prevails during many months of the year in Ankara, where the author has been collecting his observations. He has thus been able to diagnose congenital malaria in at least ro out of 25 infants with malaria in a residential nursery. He concludes by stressing the importance during pregnancy of intensive prophylaxis against malaria in endemic areas. The possibility of antenatal infection of the infant when the mother has a history of malaria should always be borne in mind, and doctors in endemic areas should become familiar with the peculiarities of malaria in infancy.

S. Doxiadis

1598. Persistent Pleuro-peritoneal Cavity (False Diaphragmatic Hernia) in the Newborn. (Cavum pleuroperitoneale persistens (Hernia diaphragmatica spuria) bei neugeborenen.)

By P. O. PARNANEN and H. HAAPOJA. Acta obstet. gynec. scand., 27, 407-417, 1948. 2 figs., 49 refs.

1599. Diabetes Mellitus in Infants under One Year of Age. Report of a Case and Review of the Literature.

By J. Schwartzman, M. E. Crusius, and D. P. Beirne. Amer. J. Dis. Child., 74, 587-606, Nov.

1947. Bibliography.

In a girl, aged 8 months, admitted to hospital for acute bronchitis, routine tests of urine revealed sugar and acetone. Diabetes mellitus, suggested by a history of this disease in a maternal aunt and cousin, was confirmed by the finding of a blood-sugar level of 600 mg. per 100 ml. and by subsequent glucose tolerance tests. One injection of 20 units of insulin was followed by a clinical hypoglycaemic reaction, but thereafter during the 7-month period of observation no insulin was necessary. Septic complications—abscess formation and, later, pharyngitis and gingivitis—were overcome by systemic administration of penicillin. Dextrose tolerance curves in both parents and in 6 other children were normal.

[The series revealed a worse prognosis than can reasonably be expected in these days of early diagnosis and correct treatment. The author's plea for routine dextrose tolerance tests on any infant with a family history of diabetes "every two mouths for the first year and every six months thereafter" seems unwise, since most parents of such children make the diagnosis for themselves and are only too apprehensive of early symptoms.]

H. Whittaker

1600. Penicillin in the Treatment of Gonococcal Ophthalmia of the Newborn and of Septic Endophthalmitis. (La penicilina en el tratamiento de la oftalmia gonocócica del recien nacido y en la endoftalmitis séptica.)

By E. Dalgado Benavides. Arch. Soc. oftal.

hisp.-amer., 7, 1121-1128, Nov. 1947.

The author states that although penicillin modifies the picture in panophthlamitis, it has no advantages over the sulphonamides. Even when systemic administration is combined with subconjunctival, anterior-chamber, and intra-vitreous injections, the results are no better. He has found that the most severe cases of gonococcal ophthalmia improve with repeated irrigations of boiled water and injection of penicillin (5,000 units). After the third injection of penicillin the oedema disappears, and the gonococcus is no longer found in the pus.

E. E. Cass

1601. Oral Penicillin in Young Children.

By A. I. Suchett-Kaye and R. B. Latter. Brit.

med. J., 2, 953-954, Dec. 13, 1947. 4 refs.

Calcium penicillin tablets were given in doses of 10,000 to 20,000 units every 3 or 4 hours for infants under 6 months, 20,000 to 30,000 units for children of 6 to 12 months, and 30,000 to 40,000 units for those over 1 year. Eighteen cases of bronchopneumonia and 5 cases of lobar pneumonia were treated, but in 4 treatment was interrupted by complications and in 4 others treatment with sulphamezathine was instituted in view of failure

to respond to oral penicillin. The remaining patients made a satisfactory recovery. Adequate penicillin levels were usually present in the serum 2 hours after an oral dose. [There is little evidence in this paper of the extent of the influence of oral penicillin on the course of the disease.]

J. W. Litchfield

1602. Treatment of Infantile Diarrhoea by Streptomycin. [In English.]

By P. Leisti. Ann. Med. intern. fenn., 36, 575-

583, 1947. 1 ref.

The mortality rate in cases of infantile diarrhoea treated in the Children's Clinic, Helsinki University, has in recent years varied from 20 to 59 per cent. Penicillin having proved ineffective, streptomycin has been tried since June 1947, though only in the most severe cases. The drug has been given in doses of 5,000 to 20,000 units intramuscularly at 3-hourly intervals. Conventional treatment for dehydration was carried out concurrently. In 38 full-time infants, aged from 1 to 9 months, there were 8 deaths. In 11 cases in which streptomycin was given only after other treatment had been applied without result, the effectiveness of the drug was apparent. As judged by time of recovery, recovery of weight, and number of days in hospital, streptomycin proved beneficial in the majority of cases treated, although in 5 fatal cases it seemed without effect. All of 8 premature infants recovered; in 2 of these streptomycin was given orally and appeared as effective as by the intramuscular D. Gairdner . route.

1603. Epidemic of Salmonellosis Among Infants due to Salmonella enteritidis. (Epidemia duru rzekomego wśród niemowlat wywolana paleczka Gaertnera.)

By A. Kanski, I. Moszkowska, and Z. Skurska. Polsk. Tyg. lek., 2, 1354-1359, Nov. 24,

1947. 5 refs.

The authors give a detailed report of an epidemic Salmonella enteritidis (Gärtner), by observed among infants during the winter of 1947 in Breslau. The 40 cases which occurred could be divided into: (1) cases of gastro-entero-colitis; (2) cases of septicaemia. In the first group the organism was isolated from the stools from the ninth to the seventieth day of the illness. The agglutination tests were positive on the twenty-first day in most cases, but in one case the test was positive as early as the fourth day. The gastro-entero-colitis lasted about 4 months and gradual recovery followed. More severe symptoms were met with in the septicaemic group. In infants between 6 weeks and 6 months severe symptoms of general toxaemia occurred without any gastro-intestinal signs. Meningitis and cerebral abscesses were often encountered. In the majority of cases the organism was identified in the cerebrospinal fluid. In isolating the bacillus bone-marrow cultures were found to be more reliable than those from blood.

In this group of cases no treatment was of any avail and all the infants died. Both sulphonamides and penicillin were found to be useless.

J. T. Leyberg

1604. Neonatal Bact. Coli Meningitis after Prolonged Labour.

By H. R. DUVAL and J. T. BURROWES. Brit. med J., 1, 1180-1182, June 19, 1948. 25 refs.

1605. Vitamin C in the Blood and Urine of the Newborn and in the Cord and Maternal Blood.

By B. M. Hamil, B. Munks, E. Z. Moyer, M. Kaucher, and H. H. Williams. *Amer. J. Dis. Child.*, 74, 417-433, Oct. 1947. Bibliography.

The plasma concentration of reduced ascorbic acid was estimated in samples of cord blood, capillary blood from 24 male breast-fed infants, and venous blood from their mothers, and compared with the amounts of vitamin C excreted in the infant's urine during the first week of life. The results obtained showed wide variations, but cord blood contained by far the highest concentration of vitamin C, and the average value for the babies' blood, though only about half that for cord blood, was higher than that for mothers' blood. Concentrations of vitamin C in urine were high during the first 2 days of life, but if the babies were not supplied with vitamin C urinary excretion dropped rapidly to low levels or disappeared as the blood level of the vitamin decreased. Vitamin C is thought to exercise a function in cell chemistry, and if this is so presumably more of the vitamin would be required during the state of low oxygen tension of the blood in intrauterine life than after birth, at which time changes in renal function contribute to abundant urinary excretion.

M. Baber

1606. Acute Anaemia of the Newborn Due to Subaponeurotic Cephalhaematoma. (Anemia acuda del recién nacido por cefalohematoma subaponeurótico.)

By G. Gil. Rev. chil. Pediat., 18, 855-862, Nov. 1947. 1 fig., 7 refs.

1607. Inclusion Bodies (Protozoon-like Cells) in the Organs of Infants.

By D. F. CAPPELL and M. N. McFarlane. J. Path. Bact., 59, 385-398, July, 1947. 10 figs.,

bibliography.

The previous literature is reviewed and analyzed. Two cases are recorded here. Both infants had clinical signs of haemolytic disease of the newborn but in neither was it possible to show that there had been iso-immunization of the mother. Significantly, the mother of the first infant had a subsequent normal child (her fourth), while in the second case the infant was a first child. Both infants showed obvious extramedullary haematopoiesis and the presence of inclusion bodies in various epithelia, such as renal tubules, bile ducts, pancreas, or pulmonary alveoli. [The morphology

of the bodies is fully described and the illustrations are excellent.] The bodies resemble closely the salivary-gland inclusions seen in various animals, including man, and the suggestion is made that these cases may be examples of the generalization of salivary virus which can be produced experimentally in animals.

Such infants were generally considered to have congenital syphilis; since then the clinical picture seen in most of these cases has been called haemolytic disease of the newborn. It therefore seems likely that many, although not all, of the infants showing inclusion bodies had the clinical picture which to-day we know to be characteristic of Rhesus incompatibility. It is now demonstrated that in the disease under discussion no such Rhesus incompatibility can be demonstrated. The important question is raised whether the inclusion bodies and the haemolysis may both be due to a virus infection. The close-knit argument on histological and serological grounds seems to lead to the inescapable conclusion that another disease has been discovered.

[This is the first report in the British literature on the subject and is a paper that should be read.]

\*\*A, C. Lendrum\*\*

1608. Erythroblastosis Foetalis without Rhesus-incompatibility. (Erythroblastosis foetal zonder rhesus-antagonisme.)

By H. HOYNG. Ned. Tijdschr. Geneesk., 91,

3653-3655, Dec. 13, 1947.

The following case is described to show that Rhincompatibility is by no means the only cause of erythroblastosis foetalis. A woman, aged 39, with a contracted pelvis, gave birth in the thirty-sixth week of her tenth pregnancy, after induction of labour, to a child suffering from foetal hydrops; the child died soon afterwards from erythroblastosis foetalis. Both mother and father were Rh-positive and both belonged to the blood group O. Clinical and laboratory investigation eliminated the possibility of syphilis, diabetes, and renal disease. The infants of the first five pregnancies were born alive and remained well; the first 2 were born at term with forceps application and for the other 3 premature labour was induced; 1 of them had jaundice after birth. The sixth child, also delivered after induction of labour, had jaundice and died 3 days after birth. The seventh, eight, and ninth children were stillborn between the seventh and eighth months of pregnancy; they were, according to the mother, "thick and swollen".

A. Lilker

1609. Iso-immunization as a Cause of Erythroblastosis (4 Cases Due to the Rh Factor). (Isoimmunisation als Ursache der fetalen Erythroblastenkrankheiten (Mit 4 durch den Rh-faktor bedingten Fällen).)

By P. Pfau. Klin. Wschr., 26, 132-136, Mar. 1, 1948. 1 fig., 30 refs.

1610. The isoLeucine Requirement of the Infant. By A. A. Albanese, L. E. Holt, V. I. Davis. S. E. SNYDERMAN, M. LEIN, and E. M. SMETAK. J. Nutrit., 35, 177-183, Feb. 10, 1948. 1 fig., 6 refs.

In order to determine whether the higher requirement of infants for nitrogen is due to the limiting factor of a single amino-acid or to a higher demand for all of the amino-acids, it is necessary to carry out "balance" experiments with single aminoacids. In this paper experiments with isoleucine are recorded. Five normal healthy male infants of 4 to 10 months were fed on a hydrolyzed beef haemoglobin as a source of protein. On a diet low in isoleucine there was a big decrease in nitrogen retention. In 3 infants this was made good by 120 mg. per kilo per day. Two other infants were tested with levels of 60 and 90 mg. of isoleucine per kilo per day; the former showed a low retention of nitrogen while in the latter retention was normal. It is deduced that the requirements of isoleucine are approximately go mg. per kilo per day. Unlike deficiency of tryptophan, deficiency of isoleucine had no effect on the level of plasma protein or of haemoglobin. This is of interest in that both of these proteins are low in isoleucine.

1611. Thiamine, Riboflavin, Nicotinic Acid, Pantothenic Acid and Biotin in the Urine of Newborn Infants.

By B. M. HAMIL, M. CORYELL, C. RODERUCK, M. KAUCHER, E. Z. MOYER, M. E. HARRIS, and H. H. WILLIAMS. Amer. J. Dis. Child., 74, 434-446, Oct. 1947. 2 figs., 41 refs.

Estimations of the daily urinary excretion of the vitamins of the B complex were undertaken in newborn infants as a preliminary to assessing the nutritional status of the babies as regards these substances. A wide range of concentrations was found in specimens collected from different infants and even from the same infant during the first few days, but maximal average concentrations of thiamin and of pantothenic acid were found in urine excreted on the third day of life. For riboflavin the maximal average value was found on the first day, and for nicotinic acid and biotin on the second day. The concentration of all vitamins in the urine decreased greatly after the first few days, very low levels being reached by the fifth day postpartum in spite of abundant intake of breast milk. This large excretion of vitamins presumably indicates a high foetal storage, which may be related to the intrauterine state of low oxygen tension. Changes in pH or oxygen tension, or other physical factors which occur at birth, may be responsible for the excretion of vitamins in the neonatal period, as the latter may be related to purely physiological changes in renal function at birth. M. Baber

1612. Some Observations on the Artificial Feeding of the Normal Infant.

By W. EMDIN. S. Afr. med. J., 22, 313-315, May ১, 1948.

1613. Concentrated Human Milk. (Latte umano concentrato.)

By A. BIEBER. Riv. Clin. pediat., 45, 577-604, Oct. 1947. 23 figs., 13 refs.

Human milk was concentrated by boiling at 55°C. under reduced pressure until the volume was halved. It was then stored in a refrigerator. There was no alteration in taste or smell. Average values were: for protein 2.1 per cent, fat 5.8 per cent, sugar 13 per cent, vitamin C 80 to 160 mg. per litre. Microscopically, there was a great preponderence of small fat, globules. The concentrate was used for infants in addition to the routine milk feeds. Quantities varying from 30 g. to 100 g. daily, according to the size of the main feed, were given to 22 infants—18 premature and 4 weakly babies. In all there was an immediate upward movement in the weight curve. Compared with other babies in the clinic given the same care and routine feeding, there was a pronounced increase in the rate of development. The weight was doubled in 60 to 70 days, instead of 90. The author believes that the good result was partly due to the fact that the diet became adequate as regards essential proteins. The daily amount required, according to Levine, is 4.4 to 6 g. for a baby weighing less than 2 kg. This amount is not secured with the usual feeds given to premature infants, but is attained on adding concentrated milk. The improvement in the appearance of these babies was striking, apart from the actual gain in weight.

[It is difficult to share the author's belief that the infant benefits from the increase in protein, since the value is raised only very slightly by this feeding method. It is also not clear whether there was any selection of cases. If there was not, there must have been some other reason for the failure of so many premature infants to thrive.]

J. G. Jamieson

1614. Investigations on the Preservability and Preservation of Mother's Milk. Preliminary Report. [In English.]

By E. Seleste. Ann. Med. intern. fenn., 36,

630-646, 1947.

The influence of various factors upon the preservability of human and cows' milk was studied by measuring decreases in the pH of milk samples over periods of 5 days, since bacterial growth tends to acidify milk. The following were the main conclusions reached; in general, these applied whether the milk was preserved at -5.5°C., at 20°C., or at 37°C. Human milk drawn from breasts cleansed with spirit keeps better than milk from breasts which are merely washed with water. Heating human milk to 80°C. for 2 minutes impairs its preservability; the reverse is true of cows' milk. On the other hand, when human or cows' milk is heated to 62°C. for 20 minutes preservability is improved. When a culture of lactic-acid-producing organisms is added to human milk which has

previously been heated to 62°C. for 20 minutes, the milk keeps better than milk which has not been previously heated. These results can be accounted for by assuming the presence of a "lysozyme" in both human and cow's milk, activation of which by moderate heat causes the destruction of bacteria.

D. Gairdner

1615. Mortality Increase in Post-mature Infants. (Die Ubersterblichkeit der Kinder bei ubertragenen Schwangerschaften.)

By W. BICKENBACH. Geburtsh u. Frauenheilk.,

7, 3-7, Oct. 1947. 1 fig., 7 refs.

The author reviews some recent literature on the subject of foetal mortality in association with prolonged pregnancy. He presents in a graph the results in such cases at the Münster Clinic from 1924 to 1942, 4,000 pregnancies of more than 279 days' duration from the first day of the last menstrual period being analyzed. The curve of foetal mortality rises sharply from 298 days onwards (1.09 per cent at 282 days to 2.83 per cent at 294 days and 25 per cent at 315 days). A plea is made for medical induction of labour at 285 days; if pregnancy goes on to 295 days this should be followed by surgical induction.

Kenneth Bowes

1616. Excess of Male Births and Excess of Male Infant Mortality. (Knabenuberschuss und Knabenubersterblichkeit.)

By H. Hosemann. Geburtsh. u. Frauenheilk., 7,

65-77, Nov. 1947.

The paradox that the "weaker sex" is the stronger has long been observed by the obstetrician. The author, using statistical material from the University Women's Clinic at Göttingen, has considered the implications of this in pregnancy and childbirth. Out of about 20,000 deliveries (1926 to 1945) 11,000 were found to be completely normal as regards pregnancy and childbirth, and this "physiological" series has been analyzed in some detail. The series yielded a sex proportion of 107.5 males to 100 females at birth (cf. European total of 106:100). About 40 per cent of the births occurred during the war years and the sex proportion was 104 to 113 males to 100 females. Before the war the ratio was less. The older the mother the greater the chance of her having a female child: when the mother was under 19 the ratio was 115: 100, when she was 19 to 29 it was 108:100, when she was 29 to 39 it was 92:100, and over the age of 40 it was 44:100. Increasing parity, particularly between the third and fifth pregnancies, increases the proportion of male babies (para-1, 106 males; para-3, 112 males; para-4, 122 males).

The stillbirth rate, neonatal mortality rate, and mortality rate in immature births were higher for male children. In the total series the sex ratio for mortality was 179 males: 100 females; this may be associated with the increased cephalic measure-

ments of the male and his greater birth weight. Caesarean section was found to be significantly more common if the foetus was male, as also was forceps delivery. The sex ratio in the latter was 152:100. The male foetus is more liable to asphyxia and less able to withstand it. The total forceps mortality rate was 6.3 per cent in 1,206 cases (6.8 per cent in males, 5.8 per cent in females). A further associated factor influencing the sex ratio was found to be the type of menstrual cycle in the mother. With a "normal" 28-day cycle the sex ratio was 106:100; with a lengthened cycle it was 146:100.

Kenneth Bowes

1617. Illness Among Infants, with Comparative Mortality Data.

By S. D. Collins. *Publ. Hlth. Rep., Wash.*, 63, 637-662, May 14, 1948. 13 figs., 16 refs.

1618. Bronchial Obstruction in the Newborn. Intrauterine Suffocation. (L'obstruction bronchique du nouveau-né. La suffocation intra-utérine.)

By L. Derobert. *Presse méd.*, 56, 444–445, June 23, 1948. 6 figs., 1 ref.

1619. Obstetric Operative Trauma as a Factor in Foetal and Neonatal Mortality. (Do trauma operatório obstétrico como fator de mortalidade natal e neonatal.)

By E. BRAGA. Rev. Ginec. Obstet., 1, 241-246, Apr. 1948. 16 refs.

## OBSTETRIC OPERATIONS

1620. Some Considerations on Caesarean Section. (Algunas consideraciones sobre operación cesárea.)

By H. C. Soto. Bol. Soc. chil. Obstet. Ginec., 12, 283-295, Nov. 1947. 28 refs.

1621. A Study of Ten Years of Cesarean Sections at Emanuel Hospital.

By C. L. FEARL. West. J. Surg. Obstet. Gynec., 56, 290-297, May 1948. 16 refs.

1622. 282 Cases of Caesarean Section. (Commentario sobre 282 casos de cesarea.)

By P. Jofre. Bol. trim. Hosp. Vina d. Mar., 4, 45-51, Apr. 1948. 11 refs.

1623. The Outlook for the Infant after Caesarean Section. (L'avenir des enfants nés par césarienne.)

By P. LANTUEJOUL and P. JANNY. Bull. Acad. nat. Méd., Paris, 132, 146-148, Mar. 2, 1948. 2 figs.

1624. Shortened Cord as an Indication for Caesarean Section and Other Obstetric Operations. (Uber die durch zu kurze oder verkürzte Nabelschnur bedingte Indikation zum Kaiserschnitt und zu anderen geburtshilflichen Operationen.)

By F. v. Kuhbacker. Geburtsh. u. Frauenheilk., 8, 372-376, Apr. 1948.

1625. The Pfannenstiel Incision for Cesarean Section. By D. W. DECARLE and R. B. DURFEE. West. J. Surg. Obstet. Gynec., 56, 360-364, June 1948. 4 refs.

1626. Symphysiotomy in the Antibiotic Age. (La sinfisiotomia en la era antibiótica.)

By A. P. Ramos. Obstet. Ginec. lat.-amer., 6, 3-12, Jan.-Feb., 1948. 4 refs.

# GYNAECOLOGY

General.

1627. The Blood Glutathione and Oxidative-reduction Processes in Gynaecological Conditions. [In Russian.]

By F. D. ANISKOVA. Akush. Ginek., No. 2, 10-15, 1943.

1628. Analysis of the Causes of Death in Gynaecological Conditions. [In Russian.]

By M. A. DANIAKHI and Z. I. GUREVITCH. Akush. Ginek., No. 2, 35-42, 1948.

1629. Iron Deficiency in Gynaecology. (Les aspects de la carence en fer dans la pratique gynécologique.)

By J. A. SCHOCKAERT, J. P. HOET, M. RENAER, and J. LEDERER. Brux.-méd., 28, 1150-1156, June 6, 1948.

### Disorders of function

1630. Artificial Reproduction of the Cyclic Changes in Cervical Mucus in Human Castrates, with Clinical Correlations.

By A. R. ABARBANEL. West. J. Surg. Obstet.

Gynec., 56, 26-34, Jan. 1948. 2 figs.

The results of this investigation are listed under four headings. In the first of these, the cyclic changes in cervical mucus during the normal menstrual cycle were observed. In the postmenstrual phase (days 5 to 9 of the cycle) the mucus was noted to be opalescent, to contain polymorphonuclear leucocytes, and to be of a somewhat gelatinous consistency. Spermatozoa did not usually penetrate this mucus, but if they did they were very quickly bogged down so that at the end of an hour or so they were immobile and had only traversed a few millimetres. In the pre-ovulatory phase (days 10 to 15 of the cycle) well-marked changes took place in the character of the mucus at or about the time of the ovulatory dip in basal body temperature. There was increase in volume and decrease in viscosity, and leucocytes disappeared almost completely. If leucocytes persisted then endocervicitis was almost invariably present. At this time spermatozoa penetrated easily and rapidly in great numbers. In cervical mucus at this stage spermatozoa usually lived for 24 to 72 hours. When the post-ovulatory phase was studied (days 16 to 28 or 30) the cervical mucus had decreased in

amount and increased in viscosity, and repelled the penetration of spermatozoa, which rapidly became immobile and then immotile. Menstrual fluid was easily and rapidly penetrated by spermatozoa which remained actively motile for 24 to 48 hours in it.

In the second group the effects of various oestrogens and progesterone were investigated. These substances were given to suitable hysterectomized, bilaterally ovariectomized women who had an apparently normal cervical stump. The changes of the proliferative phase could be reproduced exactly when oestrogen preparations were given, and the post-ovulatory or luteal phase when progesterone was administered but only provided that it had been preceded by an oestrogen. Progesterone itself had no effect on the cervical mucus. In the presence of endocervicitis (group 3) the cervical mucus was found to be viscid and generally scanty. Leucocytes were present and clumped in large aggregates but, strangely enough, slight variations in volume and viscosity were noted at or about mid-cycle. The author believes that endocervicitis results in the loss of fluid (? water) by the mucus with resultant increase in viscosity. In the fourth group, experiments were made on the penetration by spermatozoa of mucus which had been sealed in a capillary tube and mucus which had been exposed to the air at room temperature. Almost invariably the mucus from the sealed tube was easily penetrated by spermatozoa, even after such a lengthy period as 2 weeks. With the exposed mucus penetration did not take place.

The author concludes with some practical clinical points dealing with the post-coital test (Smith-Sims-Huhner test), endocervicitis, pin-point os, and scanty or absent mucus in mid-cycle. The postcoital test should be performed on the eleventh, fourteenth, and (if necessary) seventeenth day of the cycle. Treatment of endocervicitis by conization of the cervix is advised and, if necessary, artificial insemination with the husband's semen beyond the endocervix. Pin-point os is rarely responsible for infertility, and scantiness or absence of mucus in mid-cycle may follow extensive cauterization of the cervix or may be congenital. It is noted that when tubal insufflation is performed with the olive of the cannula pressed home into the cervical canal, dilatation of the canal takes place with consequent pouring forth of cervical secretions. In the author's opinion, therapeutic success should be ascribed to this effect rather than to the bubbles of carbon dioxide gurgling through the tubal lumen. E. L. Nicolson

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1631. Preparations of Female Sex Hormones and Their Use in Gynaecology. [In Russian.]

By K. P. PREOBRAZHENSKI. Akush. Ginek., No. 2, 27-35, 1948.

1632. Studies on Antihormone Specificity with Particular Reference to Gonadotropic Therapy in the Female.

By J. H. LEATHEM and A. E. RAKOFF. *J. Clin. Endocrinol.*, **8**, 262–268, Mar. 1948. 8 refs.

1633. Ethinyl Estradiol.

By C. H. BIRNBERG, S. H. LIVINGSTON, L. KURZROK, and D. A. SHERBER. Amer. J. Obstet. Gynec., 54, 855–860, Nov. 1947.

The effect of ethinyl oestradiol was observed (1) in the menopause; (2) in amenorrhoea, primary and secondary; (3) in suppression of postpartum lactation; and (4) in labour. In menopausal cases up to three 0.05-mg. tablets of ethinyl oestradiol were administered daily, depending upon the severity of the symptoms; 45 patients (79 per cent) had complete relief from menopausal symptoms, 10 patients (17 per cent) had moderate relief, and 2

patients (4 per cent) had no relief. For amenorrhoea, 0.05 mg. ethinyl oestradiol was given daily for 20 days, followed by a 10-day interval. The duration of treatment was from 4 to 6 months; patients bled periodically, and there was growth of the uterus and cervix. Eight patients bled regularly after treatment was stopped; in 6 of these, aged between 18 and 21 years, biopsy revealed secretory endometrium. For inhibition of postpartum lactation in non-nursing mothers 30 tablets

of ethinyl oestradiol, 0.05 mg., were given over a

period of 9 days. In 85 (58 per cent) there was sup-

pression of lactation; results were good in 23

patients (16 per cent), fair in 22 (16 per cent), and

poor in 15 (10 per cent). The same dose was used in

26 [sic] nursing mothers with complete suppression

in 6 patients, partial suppression in 17, and no sup-

pression in 6. A dose of 6 tablets of ethinyl

oestradiol, 0.05 mg., was given every 2 hours for

up to 15 doses in an attempt to induce labour in 15 patients. In 10 of these it was successful, delivery occurring within 50 hours. A similar dose was used in 34 patients suffering from uterine inertia and was successful in 30 cases, patients being delivered within 20 hours. [No details are given.]

1634. Intrauterine Hormone Therapy with Oestrogens. Basic Principles, Experimental Results and Clinical Possibilities. (Hormonoterapia intrauterina con estrógenos. Fundamentos, resultados experimentales y perspectivas clinicas.)

By A. Ferreira Gómez. Rev. esp. Obstet. Ginec., 6. 81-93, 185-199, 273-284, and 339-355, Mar-Apr., May-June, July-Aug., and Sept.-Oct. 1947. 60 figs. Bibliography.

In view of the frequent failures and disadvantages of oestrogen therapy, the author has made a full experimental and clinical study of the intrauterine use of oestrogens, and reports in detail his findings in a series of articles. Injection of oestrogens into the uterine cornua of both young and castrated adult rabbits resulted in an enormous

increase in size of the whole genital apparatus and in particular of the injected cornu. This growth was bigger than that produced by parenteral injection of doses even fifty times greater. The effect was rather more pronounced after oestradiol benzoate

than after synthetic oestrogens.

Treatment was carried out in 20 cases—9 of primary amenorrhoea with defective uterine development, 6 of secondary amenorrhoea with a hypoplastic uterus, 3 of uterine atrophy, and 2 of uterine malformation. In 16 cases the treatment was completely successful. The methods of application were the insertion or injection of fluids.

cation were the insertion or injection of fluids, pastes, or bougies into the uterine cavity, and the injection of fluids into the uterine wall with a needle. All methods were satisfactory, but the use of bougies was found to be the most convenient. A daily dose of I mg. of oestradiol benzoate or stilboestrol repeated up to ten or more times was found to be satisfactory. In 3 cases of secondary amenorrhoea the daily injection of I mg. of progesterone into the lumen of the uterus for 3 days after the injection of oestrogen resulted in the occurrence of the secretory phase in the endometrium and in menstruation. The parenteral use of progesterone, as well as of gonadotrophins and vitamin E, and other measures may also be necessary for the establishment of menstruation. In cases of amenorrhoea with a uterus of normal size this route of treatment is not necessary, and other ways of administration are better and more convenient. This method has no disadvantages or dangers, apart from the risk of sepsis present with any intrauterine manipulation and the difficulties of treatment in young patients. The author con-

ungen des Ovarium durch Thiouracil und Methylthiouracil.)

By R. Kopf, A. Loeser, and G. Meyer. Klin.

Wschr., 26, 202-206, Apr. 1, 1948. 2 figs., 28 refs.

siders that it should have an important if limited

place in treatment in the future, and that the way

has been opened up for local treatment with other

1635. Changes in Ovarian Function Due to

Thiouracil and Methylthiouracil. (Funktionsander-

Bryan Williams

hormones.

1636. Oestrogenic Endocrine Disorders. (Les endocrinoses oestrogènes.)
By J. A. Huet and A. D. Herschberg. Ann. Endocrinol., Paris, 8, 510-533, 1947. 1 fig., Biblio-

graphy.

1637. Ovarian Infantilism. (Infantilisme ovarien.)

By P. Harvier, J-J. Gournay, J-L. Camus, and L. Vissian. Paris méd., 88, 281–286, June 19, 1948.

5 figs., 6 refs.

1638. Ovarian Insufficiency and Raynaud's Disease.

(Insuficiencia ovariana e doença de Raynaud.)

By G. MASCARENHAS. Rev. Ginec. Obstet., 1, 262-270, Apr. 1948. 8 figs., 11 refs.

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1625. The Pfannenstiel Incision for Cesarean Section. By D. W. DECARLE and R. B. DURFEL. West. J. Surg. Obstet. Gynec., 56, 360-364, June 1948. 4 refs.

1626. Symphysiotomy in the Antibiotic Age. (La sinfisiotomia en la era antibiótica.)

By A. P. Ramos. Obstet. Ginec. lat.-amer., 6, 3-12, Jan.-Feb., 1948. 4 refs.

#### GYNAECOLOGY

General.

1627. The Blood Glutathione and Oxidative-reduction Processes in Gynaecological Conditions. [In Russian.]

By F. D. ANISKOVA. Akush. Ginek., No. 2, 10-15, 1943.

1628. Analysis of the Causes of Death in Gynaecological Conditions. [In Russian.]

By M. A. Daniakhi and Z. I. Gurevitcii. Akush. Ginek., No. 2, 35-42, 1948.

1629. Iron Deficiency in Gynaecology. (Les aspects de la carence en fer dans la pratique gynécologique.)

By J. A. SCHOCKAERT, J. P. HOET, M. RENAER, and J. LEDERER. Brux.-méd., 28, 1150-1156, June 6, 1948.

#### Disorders of function

1630. Artificial Reproduction of the Cyclic Changes in Cervical Mucus in Human Castrates, with Clinical Correlations.

By A. R. ABARBANEL. West. J. Surg. Obstet.

Gynec., 56, 26-34, Jan. 1948. 2 figs.

The results of this investigation are listed under four headings. In the first of these, the cyclic changes in cervical mucus during the normal menstrual cycle were observed. In the postmenstrual phase (days 5 to 9 of the cycle) the mucus was noted to be opalescent, to contain polymorphonuclear leucocytes, and to be of a somewhat gelatinous consistency. Spermatozoa did not usually penetrate this mucus, but if they did they were very quickly bogged down so that at the end of an hour or so they were immobile and had only traversed a few millimetres. In the pre-ovulatory phase (days 10 to 15 of the cycle) well-marked changes took place in the character of the mucus at or about the time of the ovulatory dip in basal body temperature. There was increase in volume and decrease in viscosity, and leucocytes disappeared almost completely. If leucocytes persisted then endocervicitis was almost invariably present. At this time spermatozoa penetrated easily and rapidly in great numbers. In cervical mucus at this stage spermatozoa usually lived for 24 to 72 hours. When the post-ovulatory phase was studied (days 16 to 28 or 30) the cervical mucus had decreased in

amount and increased in viscosity, and repelled the penetration of spermatozoa, which rapidly became immobile and then immotile. Menstrual fluid was easily and rapidly penetrated by spermatozoa which remained actively motile for 24 to 48 hours in it.

In the second group the effects of various oestrogens and progesterone were investigated. These substances were given to suitable hysterectomized, bilaterally ovariectomized women who had an apparently normal cervical stump. The changes of the proliferative phase could be reproduced exactly when oestrogen preparations were given, and the post-ovulatory or luteal phase when progesterone was administered but only provided that it had been preceded by an oestrogen. Progesterone itself had no effect on the cervical mucus. In the presence of endocervicitis (group 3) the cervical mucus was found to be viscid and generally scanty. Leucocytes were present and clumped in large aggregates but, strangely enough, slight variations in volume and viscosity were noted at or about mid-cycle. The author believes that endocervicitis results in the loss of fluid (? water) by the mucus with resultant increase in viscosity. In the fourth group, experiments were made on the penetration by spermatozoa of mucus which had been sealed in a capillary tube and mucus which had been exposed to the air at room temperature. Almost invariably the mucus from the scaled tube was easily penetrated by spermatozoa, even after such a lengthy period as 2 weeks. With the exposed mucus penetration did not take place.

The author concludes with some practical clinical points dealing with the post-coital test (Smith-Sims-Huhner test), endocervicitis, pin-point os, and scanty or absent mucus in mid-cycle. The postcoital test should be performed on the eleventh, fourteenth, and (if necessary) seventeenth day of the cycle. Treatment of endocervicitis by conization of the cervix is advised and, if necessary, artificial insemination with the husband's semen beyond the endocervix. Pin-point os is rarely responsible for infertility, and scantiness or absence of mucus in mid-cycle may follow extensive cauterization of the cervix or may be congenital. It is noted that when tubal insufflation is performed with the olive of the cannula pressed home into the cervical canal, dilatation of the canal takes place. with consequent pouring forth of cervical secretions. In the author's opinion, therapeutic success should be ascribed to this effect rather than to the bubbles of carbon dioxide gurgling through the tubal lumen. E. L. Nicolson

1631. Preparations of Female Sex Hormones and Their Use in Gynaecology. [In Russian.]

By K. P. PREOBRAZHENSKI. Akush. Ginek., No. 2, 27-35, 1948.

1632. Studies on Antihormone Specificity with Particular Reference to Gonadotropic Therapy in the Female.

By J. H. LEATHEM and A. E. RAKOFF. J. Clin. Endocrinol., 8, 262-268, Mar. 1948. 8 1efs.

1633. Ethinyl Estradiol.

By C. H. BIRNBERG, S. H. LIVINGSTON, L. KURZROK, and D. A. SHERBER. Amer. J. Obstet.

Gynec., 54, 855-860, Nov. 1947.

The effect of ethinyl oestradiol was observed (1) in the menopause; (2) in amenorrhoea, primary and secondary; (3) in suppression of postpartum lactation; and (4) in labour. In menopausal cases up to three o.o5-mg. tablets of ethinyl oestradiol were administered daily, depending upon the severity of the symptoms; 45 patients (79 per cent) had complete relief from menopausal symptoms, 10 patients (17 per cent) had moderate relief, and 2 patients (4 per cent) had no relief. For amenorrhoea, 0.05 mg. ethinyl oestradiol was given daily for 20 days, followed by a 10-day interval. The duration of treatment was from 4 to 6 months; patients bled periodically, and there was growth of the uterus and cervix. Eight patients bled regularly after treatment was stopped; in 6 of these, aged between 18 and 21 years, biopsy revealed secretory endometrium. For inhibition of postpartum lactation in non-nursing mothers 30 tablets of ethinyl oestradiol, 0.05 mg., were given over a period of 9 days. In 85 (58 per cent) there was suppression of lactation; results were good in 23 patients (16 per cent), fair in 22 (16 per cent), and poor in 15 (10 per cent). The same dose was used in 26 [sic] nursing mothers with complete suppression in 6 patients, partial suppression in 17, and no suppression in 6. A dose of 6 tablets of ethinyl oestradiol, 0.05 mg., was given every 2 hours for up to 15 doses in an attempt to induce labour in 15 patients. In 10 of these it was successful, delivery occurring within 50 hours. A similar dose was used in 34 patients suffering from uterine inertia and was successful in 30 cases, patients being delivered within 20 hours. [No details are D. M. Stern given.]

1634. Intrauterine Hormone Therapy with Oestrogens. Basic Principles, Experimental Results and Clinical Possibilities. (Hormonoterapia intrauterina con estrógenos. Fundamentos, resultados experimentales y perspectivas clínicas.)

By A. FERREIRA GÓMEZ. Rev. esp. Obstet. Ginec., 6, 81-93, 185-199, 273-284, and 339-355, Mar.-Apr., May-June, July-Aug., and Sept.-Oct. 1947.

60 figs. Bibliography.

In view of the frequent failures and disadvantages of oestrogen therapy, the author has made a full experimental and clinical study of the intranterine use of oestrogens, and reports in detail his findings in a series of articles. Injection of oestrogens into the uterine cornua of both young and castrated adult rabbits resulted in an enormous

increase in size of the whole genital apparatus and in particular of the injected cornu. This growth was bigger than that produced by parenteral injection of doses even fifty times greater. The effect was rather more pronounced after oestradiol benzoate than after synthetic oestrogens.

Treatment was carried out in 20 cases -- 9 of primary amenorrhoea with defective uterine development, 6 of secondary amenorrhoea with a hypoplastic uterus, 3 of uterine atrophy, and 2 of uterine malformation. In 16 cases the treatment was completely successful. The methods of application were the insertion or injection of fluids, pastes, or bougies into the uterine cavity, and the injection of fluids into the uterine wall with a needle. All methods were satisfactory, but the use of bougies was found to be the most convenient. A daily dose of 1 mg. of oestradiol benzoate or stilboestrol repeated up to ten or more times was found to be satisfactory. In 3 cases of secondary amenorrhoea the daily injection of I mg. of progesterone into the lumen of the uterus for 3 days after the injection of oestrogen resulted in the occurrence of the secretory phase in the endometrium and in menstruation. The parenteral use of progesterone, as well as of gonadotrophins and vitamin E, and other measures may also be necessary for the establishment of menstruation. In cases of amenorrhoea with a uterus of normal size this route of treatment is not necessary, and other ways of administration are better and more convenient. This method has no disadvantages or dangers, apart from the risk of sepsis present with any intrauterine manipulation and the difficulties of treatment in young patients. The author considers that it should have an important if limited place in treatment in the future, and that the way has been opened up for local treatment with other hormones. Bryan Williams

1635. Changes in Ovarian Function Due to Thiouracil and Methylthiouracil. (Funktionsänderungen des Ovarium durch Thiouracil und Methylthiouracil.)

By R. KOPF, A. LOESER, and G. MEYER. Klin. Wschr., 26, 202-206, Apr. 1, 1948. 2 figs., 28 refs.

1636. Oestrogenic Endocrine Disorders. (Les endocrinoses oestrogènes.)

By J. A. Huet and A. D. Herschberg. Ann. Endocrinol., Paris. 8, 510-533, 1947. 1 fig., Bibliography.

1637. Ovarian Infantilism. (Infantilisme ovarien.) By P. HARVIER, J-J. GOURNAY, J-L. CAMUS, and L. VISSIAN. *Paris méd.*, 88, 281–286, June 19, 1948. 5 figs., 6 refs.

1638. Ovarian Insufficiency and Raynaud's Disease. (Insuficiencia ovariana e doença de Raynaud.)

By G. MASCARENHAS. Rev. Ginec. Obstet., 1, 262-270, Apr. 1948. 8 figs., 11 refs.

1639. Menstrual Disturbances. (Trastornos menstruales.)

By M. M. FOURNIER. Ginec. Obstet. Mex., 3, 23-38, Jan.-Feb., 1948. 1 fig.

1640. Significance of the Constitutional Factor in Menstrual Disturbances and Sterility. (Die Bedeutung des konstitutionellen Faktors bei Regelstörungen und Unfruchtbarkeit.)

By E. STOCKL. Zbl. Gynäk., 69, 1087-1095, 1947.

1641. Differential Diagnosis of Amenorrhea.

By H: LISSER. Northw. Mcd., Scattle, 47, 349-350, May 1948.

1642. Post-war Amenorrhoea. (Ubersichten die Nachkriegsamenorrhöe.)

By T. HEYNEMANN. Klin. Wschr., 26, 129-132, Mar. 1, 1948. 14 refs.

1643. Primary Amenorrhoea of Uterine Origin. (Amenorrea primaria de causa uterina.)

By A. E. MARTINEZ. Bol. Soc. chil. Obstet. Ginec., 12, 273-276, Nov. 1947. 5 figs.

. 1644. Therapeutic and Diagnostic Use of Neostigmine in Secondary Amenorrhoea. (Die therapeutische und diagnostische Verwendung des Prostigmin bei sekundärer Amenorrhoe.)

By N. Aresin. Zbl. Gynäk., 69, 1067-1072, 1947.

1645. New Combined Hormone Treatment of Secondary Amenorrhoea. (Eine neue kombinierte Hormonbehandlung der sekundären Amenorrhoe.)

By H. Winkler. Zbl. Gynäk., 69, 1057-1066, 1947. I fig., 19 refs.

1646. Causes of Functional Amenorrhoea. (Uber die Ursachen der funktionellen Amenorrhoe.)

By F. v. Mikuliez-Radecki. Zbl. Gynäk., 69, 1046-1052, 1947.

1647. The Nature of Dysmenorrhea.

By R. TORPIN, R. A. WOODBURY, and G. P. CHILD. Amer. J. Obstet. Gynec., 54, 766-775,

Nov. 1947. 5 figs., 29 refs.

In this paper some of the theories of the aetiology of dysmenorrhoea are briefly reviewed. Hamilton optical manometer attached to a bag inside the uterus was used for recordings in patients with dysmenorrhoea. The tracings obtained were of two main types, one "organized" with rhythmic variations and the other "disorganized"; a third or mixture of these two was also sometimes seen. Patients in whom either tracing was obtained suffered from severe pain but it was commoner where the curves were of the "disorganized" type. The pressure associated with pain varied considerably, at times being as low as 30 nm. Hg; the average was 180 mm. Hg and the highest recorded level 340 mm. Hg. The pain was severest when a relatively high pressure persisted between the peaks. It was found that the characteristic pain could be produced experimentally either by increasing the size of the balloon or by injections of "pitressin". "Pitocin", histamine, or acetylcholine causes much less uterine activity, and has little effect on the pain. Balloons were inserted simultaneously at different levels into the uterus. The pressure changes were lower in the fundus than in the cervix; it was also noticed that cervical contractions did not necessarily correspond with the muscular activity of the body of the uterus. The authors conclude their paper with a summary of the other factors which in their view "contribute to dysmenorrhoea".

Braithwaite Rickford

1648. Distortion of the Spiral Artery in the Ovary

Associated with Corpus Hemorrhagicum Cysts. By S. M. R. REYNOLDS. Endocrinology, 40, 388-

394, June 1947. 7 figs., 2 refs.

In some of the rabbits injected with gonadotrophins (see Abstract 1429) multiple large follicles with one or more large cystic corpora haemorrhagica were produced. These were associated with local extensions of the spiral artery proximal to the cyst. The coiled arrangement of the artery was lost for 6 days but was re-established on a larger scale after 9 days. It is suggested that over-growth of the follicle stretches the spiral artery too much, so that the blood pressure transmitted to the arterioles is increased at this point and the corpus haemorrhagicum results.

[This is a fresh view of the cause of corpora haemorrhagica, which have been more often reported than accounted for.]

Peter C. Williams

1649. Pertubal Intraperitoneal Menstrual Bleeding and its Clinical Significance. (Uber pertubare, in die Bauchhöhle absliessende Menstruationsblutung und ihre klinische Bedeutung.)

By B. Ottow. Zbl. Gynäk., 69, 1116-1124, 1947.

1650. Two Cases of Vicarious Menstruation. (Zwei Fälle von vikariierender Menstruation.)

By G. Jelkmann. Zbl. Gynäk., 69, 1103-1108, 1947. 15 refs.

1651. Hormone Implants in the Menopause and Castration. (Les implantations hormonales dans le ménopause et la castration.)

By R. Bourg. Scalpel, Brux., 101, 365-372, Apr. 17, 1948.

1652. Menopausal Menorrhagia and Metrorrhagia and their treatment by Radium. (Menometrorragias do climatério e seu tratamento pelo radium.)

By A. F. MARTINS. An. brasil. Ginec., 13, 275-284, Apr. 1948. 9 refs.

1653. Hormone Treatment of Menopausal Symptoms. (Hormonbehandling ved klimakteriske besvær.)

By F. Boe. Nord. Med., 38, 1111-1112, June 4, 1948.

1654. Value of Pituitary Irradiation in Withdrawal Symptoms at the Menopause. (Uber den Wert der Hypophysenbestrahlung bei klimakterischen Ausfallserscheinungen.)

Ву А. Котек. Zbl. Gynäk., 69, 1073-1077, 1947.

1655. Fibrosis Uteri.

By R. SHOEMAKER and J. E. KAHLER. Arch.

Path., 44, 621-637, Dec. 1947. 11 refs.

Working in Los Angeles, U.S.A., the authors conducted a histo-pathological study of 27 uteri from patients aged 31 to 52 inclusive. The prominent symptom was menorrhagia. Though some patients were nulliparous, the majority had borne children. The freshly cut surface was finely textured except in the vascular layer. The consistency was abnormally firm, this change affecting the inner one-third to one-half in all cases and in half the series affecting the outer half but only so far as the outer edge of the vascular layer. The endometrium did not show noteworthy changes. From each uterus a block of tissue comprising the whole thickness of the posterior wall was fixed in Zenker's fluid and acetic acid. Use of the trichrome stain of Mallory or Masson revealed a notable increase in collagen content. No increase of elastic fibres or reticulum was found. Such an increase is significant, and, according to the authors, diagnostic for fibrosis uteri when it amounts to 15 per cent in the submucous layer. Slight hypertrophy of individual muscle fibres coexisted in 3 cases. The study establishes the fact that a defect in the submucous layer of the myometrium—a layer shown to have a poor blood supply in the follicular phase (Faulkner, Amer. J. Obst. Gynec., 1945, 49, 1)—is a causative Magnus Haines factor in menorrhagia

1656. Mechanism of Metrorrhagia in Ovarian Tumour. (Le mécanisme des métrorragies dans les tumeurs de l'ovaire.)

By J. Mathieu. Rev. franç. Gynec., 43, 85-92, Mar. 1948. 9 refs.

1657. Studies of the Human Corpus Luteum. Corpus Luteum-endometrial Relationships in Functional Uterine Bleeding.

By J. I. Brewer and H. O. Jones. Amer. J. Obstet. Gynec., 55, 18-45, Jan. 1948. 21 figs., 14 refs.

The authors postulate that functional uterine bleeding may occur even if a corpus luteum is present in the ovary. If the life of the latter is prolonged, areas of irregular regression of the endometrium may be found and give rise to bleeding. Such bleeding is an exaggeration of the normal. In other cases the corpus luteum may be normal and the endometrium correspondingly so, except in small localized regions. In these areas bleeding occurs from local blood sinuses and there is a scanty endometrial loss. This may be due either to a local "bleeding factor" or to a locally abnormal response in the endometrium. Eight cases are

analyzed. The material was obtained at operation performed during the bleeding phase. Hysterectomy was carried out, and the whole endometrium was therefore examined; either oöphorectomy or resection of the corpus luteum was performed in the same time.

Kenneth Bowes

1658. Treatment of Functional Uterine Haemorrhage (Tratamento das hemorrhagias funcionais uterinas.)

By A. DE CASTRO CALDAS. Gaz. méd. portug., 1, 175-186, 1948. 16 refs.

1659. Pathogenesis of Bleeding from Pathologically Hyperplastic Endometrium. (Zur Pathogenese der Blutung aus dem pathologisch proliferierten Endometrium.)

By V. VASEK. Zbl. Gynäk., 69, 1095-1103, 1947.

1660. Nature and Treatment of Vaginismus.

By J. Novak. *Urol. cutan. Rev.*, **52**, 128-130, Mar. 1948.

1661. Difficulties in Coitus. (Schwerigkeiten bei ber Kohabitation.)

By F. V. MIKULICZ-RADECKI. Geburtsh. u. Frauenheilk., 8, 409–423, May 1948.

1662. Infertility and the Stability of Marriage. By F. POPENOE. West. J. Surg. Obstet. Gynec., 56, 309-310, May 1948.

1663. Sterility of Unexplained Aetiology. (Atiologisch ungeklärte Fälle ehelieher Unfruchtbarkeit.) By H. STIASNY. Zbl. Gynäk., 69, 1124-1133, 1947.

1664. The Scope of Radiology in Diagnosis of the Cause of Sterility. (Possibilità della radiologia nell' accertamento delle cause di sterilità.)

By A. CAPUA. Recenti Progr. Med., 4, 389-409, May 1948. 11 figs.

1665. An Approach to the Investigation and Treatment of the Subfertile Couple.

By C. S. Lank-Roberts. *Med. Press*, 219, 547-550, June 23, 1948.

1666. Medical Treatment of Sterility. (La terapia medica della sterilità coniugale.)

By V. PATRONO. Recenti Progr. Med., 4, 410-424, May 1948. 12 refs.

1667. Ovarian Dysfunction and Sterility: Physiotherapy. (Dysfonctionnement ovarien et sterilité. Traitement physiothérapique.)

By M. Bordier. Sem. Hôp. Paris, 24, 1082-1086, Apr. 30, 1948. 31 refs.

1668. Effect of Testis Hyaluronidase and Seminal Fluids on the Fertilizing Capacity of Rabbit Spermatozoa.

By M. C. CHANG. Proc. Soc. exp. Biol., N.Y. 66, 51-54, Oct. 1947, 22 refs.

Thirty-three doe rabbits were inseminated with a minimal effective number of spermatozoa sus-

pended in saline containing purified testis hyaluronidase, or saline and supernatant fluid of heated normal semen containing hyaluronidase, or in saline and semen of vasectomized buck containing no hyaluronidase. Thirty-two does were inseminated at the same time with the same number of sperms collected from the same rabbit but suspended in saline, serving as parallel controls. It was found that it was the seminal fluid, not hyaluronidase, which really increased the fertilizing capacity of spermatozoa.—[Author's summary.]

1669. Comparison of Rates of Penetration of Unwashed and Washed Spermatozoa in Cervical Mucus.

By W. T. POMMERENKE and E. VIERGIVER. *Proc.* Soc. exp. Biol., N.Y., 66, 161-163, Oct. 1947. 12 refs.

Samples of muchs were aspirated from the cervical canals of healthy young women. Washing of spermatozoa from healthy donors was achieved by centrifuging for 10 minutes at 1,500 r.p.m. a mixture of one volume of semen and five volumes of Ringer's fluid and resuspending in Ringer's fluid. This procedure resulted in some reduction in the number of motile forms and some cell destruction. The rate of penetrability was measured by the method of Lamar, Shettles, and Delfs (Amer. J. Physiol., 1940, 129, 234). The cycle was divided into pre-ovulatory, ovulatory, and post-ovulatory phases. Average rates of penetration varied from 0.2 to 0.5 mm. per minute, while the highest rate recorded, found in mucus collected in an ovulatory phase, was 1.7 to 2 mm. per minute. Washing did not impair the ability of spermatozoa to penetrate cervical mucus. In 42 specimens of semen from 4 donors no correlation was apparent between the concentration of spermatozoa and the degree of penetrability of the mucus. Magnus Haines

1670. Interrelationships of Spermatozoa Count, Hyaluronidase Titer and Fertilization.

By B. Sallman and J. M. Birkeland. Amer. J. Physiol., 152, 271-279, Feb. 1948. 14 refs.

5 1671. Problems of Artificial Insemination. (Problemi della fecondiazione artificiale.)

By V. A. DI SANT'AGNESE. Recenti Progr. Med., 4, 369-388, May 1948. 10 refs.

Abnormalities of the Reproductive Organs

1672. Uterine Anomaly: Duplication of Uterus, Three Tubes and Three Ovaries. Report of a Case.

By W. N. Rowley. Ann. Surg., 127, 676-680, Apr. 1948. 1 fig., 2 refs.

1673. A Rare Congenital Malformation: Uterus Unicornis and Unilateral Renal Agenesia. (Une anomalie congénitale rare: Utérus unicorne vrai et agénésie rénale unilatérale.)

By C. Frieux. Gynécologie, 44, 274-278, Nov.-Dec. 1947. 12 refs.

1674. Inguinal Ectopia of the Ovary.

By F. B. PACKARD and E. M. RECTOR. Northw. Med., Seattle, 47, 354-355, May 1948. 5 refs.

Infections of the Reproductive Organs.

1675. Mechanism of Action of Penicillin. [In Russian.]

By L. I. Bublichenko. *Ahush. Ginek.*, No. 1, 35-37, 1948.

1676. Tissue Therapy of Inflammation in Gynaecology. [In Russian.]

By V. N. NEKHAEVA. Ahush. Ginek., No. 2, 25-27, 1948.

1677. Blocking of Head's Zones in the Treatment of Acute Gynecological Inflammations.

By N. P. VERKHATSKY. Akush. Ginek., No. 5,

55-56, 1947.

In 160 cases of acute pelvic inflammation the cutaneous areas of referred pain were infiltrated intradermally with 1 per cent solutions of procaine, amidopyrine, or phenazone. Procaine (2 to 15 ml.) was successful in abolishing pain in 45 out of 60 cases. Amidopyrine (1 to 2 ml.) was found to act better and for a longer time, and was successful in abolishing pain in 60 out of 70 cases. The effect of phenazone was unsatisfactory and negligible for practical purposes. Distilled water was used as a control in 10 cases and had a partial effect in 3 cases. The disappearance of pain after local injection was a good prognostic sign.

Nicolas Tereshchenko

1678. Contribution to the Study of Genital Warts. (Contribution à l'étude des végétations vénériennes.)

By J. Rudloff. Ann. Derm. Syph., Paris., 8, 23-25, Jan. 1948. 54 refs.

A useful summary is given of work on the aetiology of genital warts. The author concludes that common hard warts and genital warts are caused by the same virus, the type of lesion depending on the soil in which it is implanted. [There is a full bibliography.]

James Marshall

By J. Parks and S. Martin. Amer. J. Obstet. Gynec., 55, 117-132, Jan. 1948. 10 figs., 32 refs.

Common skin lesions such as lichen planus, allergic reactions, herpetiform infections, and psoriasis, when involving the vulva may present a greatly distorted picture because of secondary infection and ulceration. Not only should the vulva be inspected, but a thorough search should be made elsewhere for skin lesions, important areas being the lips, mouth, tongue, hair line, axillae, palms of the hands, back, and breasts. The urethra, Bartholin's glands, vagina, and cervix should be searched for infection. In every instance of vulval ulceration the following investigations should be carried out; complete blood count, chemical

analysis of urine, cultures for gonococci and mycotic organisms, and a hanging-drop examination for *Trichomonas vaginalis*. The need for biopsy, venereal disease tests, and chemical analysis of blood depends on the history and characteristics of lesion.

The author describes the vulval lesions encountered in blood dyscrasias, uraemia, diabetes mellitus, vitamin deficiencies, chronic atrophic dermatitis of the vulva, and allergic dermatitis. He emphasizes that, in the treatment of those vulval lesions for which stilboestrol is indicated, local application is as effective as systemic administration, and that with it the patient experiences none of the effects of the uterine changes associated with oral or intramuscular administration.

Anthony W. Purdie

1680. Tattooing with Mercury Sulfide for Intractable Anal Pruritus with Brief Reference to Vulval Pruritus and Evaluation of Results.

By R. Turrell. Surgery, 23, 63-74, Jan. 1948.

13 figs., 7 refs.

The rationale of tattooing with mercuric sulphide in the treatment of pruritus ani is still uncertain, but it is suggested that the mercuric sulphide deposited in the corium impairs the function of the sensory end-organs. A series of 160 cases was treated by tattooing after orthodox methods had failed; 93 of these are analyzed. Seventy patients, who had severe and chronic anal pruritus associated with cutaneous changes, responded well, 15 results being described as "satisfactory" and the rest as "good". Of 23 patients with anal pruritus but without skin changes, 6 obtained satisfactory relief and 17 were not improved at all. Twelve patients with pruritus ani and pruritus vulvae were treated by tattooing of the perianal skin. The vulval pruritus improved sufficiently to render further tattooing unnecessary. Before tattooing is undertaken a patch test for sensitivity to mercury is carried out. A positive result contraindicates tattooing. Anal skin tags are excised and menopausal women are given oestrin. Tattooing is performed under regional analgesia. If skin changes are absent the area affected is marked out before operation. Tattooing should extend into the anal canal as far as the muco-cutaneous junction and for 1 cm. beyond the area of perianal skin affected. A mercuric sulphide paste is applied to the skin and the area tattooed until the skin shows a permanent and uniform red stain. The ordinary instrument of the tattoo artist may be used, but this is tedious, and the author has designed a reciprocating (2,000 strokes a minute) pneumatic tattooing pistol with which the tattooing can be completed in an average case in about an hour. R. E. Horton

1681. New Treatment of Resistant Idiopathic Pruritus Vulvae. (Nuevo tratamiento del prurito vulvar esencial rebelde.)

By F. AGUIRRE. Rev. mex. Cir. Ginec. Cancer, 15, 395-399, Oct. 1947. 2 figs., 7 refs.

1682. Pruritus Ani and Vulvae.

By M. T. VAN STUDDIFORD and L. D. McLEAN. New Orleans med. Surg. J., 100, 445-449, Apr. 1948. 10 refs.

1683. A Study of the Bacterial Flora of the Normal Vagina. (Posšvní mikroby u žen bez vytoku.)

By J. Malkova and I. Malek. Ceskoslov.

Gynaec., 13, 59-76, 1948. 3 refs.

The authors examined 132 vaginal smears and cultures from 39 women not suffering from noticeable discharge, with a view to assessing the value of the smear alone in diagnosis and to studying the influence of menstruation on the vaginal flora. It was found that the smear gave a sufficiently accurate picture. Bacteria which were found in the cultures but not in the smears were usually aerobes which could be considered as contaminantsmainly Bacterium coli, Streptococcus faecalis, and a new species described by the authors in 1943 as Pseudomonas odorans. The anerobes found were mainly bacteroids, fusobacteria, leptotrichia, and corynebacteria. The menstrual period caused an increase in contaminants, mainly from the intestine (Bact. coli), whereas Str. faecalis was a much more constant contaminant; as the organisms appear already during the last few days before the onset of the flow, the increase cannot be explained on purely mechanical grounds.

The investigation shows that organisms may be present in the vagina without causing symptoms and without appearing in smears; these organisms may become dangerous, if transferred to other sites (for example, by tubal insufflation or abortion). They may be cultivable only during the menstrual period, but their presence should be suspected if the smear shows, besides Döderlein's bacillus and epithelial cells, an increased quantity of leucocytes. These organisms increase during menstruation, probably because of more favourable internal conditions; in the same way Döderlein's bacillus shows certain changes during menstruation—decrease in quantity and greater frequency of the less physiological R-phase.

A. Rohan

1684. A Study of the Antagonism between Lactobacillus vaginalis (Döderlein) and other Lactabacilli, and Penicillium notatum. (Ricerche sull'antagonismo tra il Lactobacillus vaginalis (Döderlein) e altri lactobacilli, e il penicillium notatum.)

By D. CAZZOLA and A. TARTARA. Monit. ostet.-

ginec., 18, 41-64, Jan:-June, 1947. 36 refs.

The authors are studying the mycotic flora of the female genital apparatus. Several types of the Penicillium species have been isolated, and the frequent presence of *Penicillium notatum* in the vaginal area led the authors to consider a possible biological function of this organism. In this work the relation between the activity of *P. notatum* and Döderlein's bacillus was investigated.

Vaginal secretion was taken from 8 women at various stages of pregnancy; the technique used is given. Tests were made: (1) of the antibiotic action of P. notatum on the lactobacilli; (2) of the antagonism between the lactobacilli and filtrates of P. notatum; (3) with penicillin; and (4) of the antibiotic action of the vaginal secretion. Colonies were studied anaerobically in glucose-liver-broth and glucose-liver-agar, and aerobically on glucose-liver-agar, serum-milk-peptone-agar, and milk.

Glucose-liver-agar was particularly useful for isolating Döderlein's bacillus. Both lactobacilli and Döderlein's bacillus grew well in glucose-liver-broth and in milk-serum but the former medium gave a more rapid and greater yield. Antagonism exists between the active principle of *P. notatum* and the lactobacilli. This antagonism is related to vaginal conditions and to the dose of penicillin. Döderlein's bacillus and the other lactobacilli studied, together with *Lactobacillus acidophilus*, are to be included in the group of penicillinsensitive organisms. The authors have also shown that the vaginal secretion has an antagonistic action toward the lactobacilli studied

Rina Saunders

1685. Mycotic Vulvovaginitis and the Vaginal Fungi. A Report of 280 Patients.

By C. P. Jones, B. Carter, W. L. Thomas, R. A. Ross, and R. N. Creadick. *Amer. J. Obstet. Gynec.*, 54, 738-747, Nov. 1947. 1 fig., 22 refs.

The authors state that there are three groups of yeast or yeast-like fungi which may be found in the vagina—Monilia, Cryptococcus, and Saccharomyces. These organisms can only be distinguished by the morphological characteristics of colonies grown on special media. Monilia, or Candida (the name now recommended), is probably the only organism of this type which gives rise to symptoms. The clinical findings and diagnosis are described, and the methods of collecting and culturing specimens from patients are given. Intradermal skin tests and agglutination reactions are of little value in diagnosis. For treatment, a vaginal jelly with a "bentonite" base containing calcium and sodium propionate has given excellent results.

Braithwaite Rickford

1686. Gonococcic Vaginitis in Children Treated with a Single Injection of Penicillin in Beeswax and Peanut Oil. Report of Twenty Cases.

By B. G. CLARKE and H. H. EISENBERG. Amer. J. Dis. Child., 74, 707-710, Dec. 1947. 18 refs.

This paper describes the effects of a single injection of 200,000 Oxford units of sodium penicillin in oil in the treatment of vaginitis in negro children. Altogether 20 patients were treated, but 2 received only 100,000 units. There were no untoward reactions in any case, and cure appeared to be prompt and complete.

Patrick Mallam

1687. Trichomonas Vaginalis and its Pathogenetic Character. (Rzesistek pochwowy (Trichomonas vaginalis) i jego rola chorobotwórcza.)

By A. ETTINGER. Przeg. Leh., 3, 774-778, Nov. 1947. Bibliography.

1688. Trichomonas Vaginitis. (Colpitis tricomoniásica.)

By R. Osorio y Carajal. Ginec. Obstet. Méx., 3, 39-44, Jan.-Feb. 1948. 10 refs.

1689. Trichomonas Vaginalis: Incidence, Signs, Symptomatology and Special Cases.

By W. McK. H. McCullagh. Med. Press, 219, 469-471, May 26, 1948.

1690. Diathermy Coagulation in Chronic Cervicitis. (Fisioterapia con diatermocoagulazione della esocervicite cronica del collo dell'utero.)

By G. M. REVIGLIO. Ginecologia, Torino, 14, 146-152, Mar. 1948.

1691. Conservation in Treatment of Severe Adnexal Inflammation. (De la conservation dans le traitement des annexites graves.)

By J. Mousselon. Rev. franç. Gynéc., 43, 105-114, Mar. 1948.

1692. Morphological Changes in the Fallopian Tubes and Body of the Uterus in Chronic Inflammation. [In Russian.]

By M. I. Maleva. Akush. Ginek., No. 2, 1-7, 1948. 6 figs.

1693. Absorption and Chemical Decomposition of Iodized Oil in the Inflamed Fallopian Tube. (Resorption und chemischer Abbau des Jodöls in entzundlich veränderten Eiletern.)

By M. KNEER. Zbl. Gynäk., 69, 959-972, 1947-9 figs., 13 refs.

1694. Detection of Latent Genital Tuberculosis by Culture of Menstrual Discharge.

By I. HALBRECHT. Lancet, 2, 947-948, Dec. 27,

1947. 6 refs.

Endometrial biopsies have shown that latent genital tuberculosis is commoner than hitherto suspected, occurring in at least 5 per cent of cases of primary sterility. Endometrial biopsy, however, can give a positive result only when tuberculosis has reached that particular portion of the endometrium removed for scrutiny. Furthermore, instrumentation is dangerous in such cases, and in 5 cases of tuberculous endometritis in the author's series severe pelvic peritonitis developed after curettage. In view of these objections the author undertook culture of menstrual blood obtained from the fornix and the os with a vaginal speculum on the first or second day of the menses, and repeated his examination at least thrice in each patient. Petragnani's specific culture medium was used. Of 140 tests in 80 women with primary sterility, including 10 with proved endometrial

tuberculosis and 2 others clinically suspected of genital tuberculosis, culture was positive nine times in 6 women. Nineteen other cultures grew nonpathogenic acid-fast bacilli differing from Mycobacterium tuberculosis culturally and morphologically. The author suggests that this is the only safe method of establishing the diagnosis where genital tuberculosis is clinically suspected, and that at least three examinations should be carried out in all cases of primary sterility before intrauterine intervention is undertaken. No genital tuberculosis was found in the husbands of any of the women in whom menstrual blood culture was positive.

[Culture of menstrual blood was positive in only 2 of 10 proved cases of endometrial tuberculosis. Its value as a safeguard before operation is therefore limited and endometrial biopsy remains much more likely to yield a true diagnosis.]

J. A. Chalmers

1695. New Method for Diagnosis of Genital Tuberculosis. (Un nuevo método para el diagnóstico de la tuberculosis genital.)

By P. DE LA PENA REGIDOR. Rev. esp. Obstet. Ginec., 7, 119-120, Mar.-Apr. 1948. 2 refs.

1696. Female Genital Tuberculosis. (Tuberculosis genital femenina.)

By M. URRUTIA. Ginec. Obstet. Mex., 3, 139-148, Mar.-Apr. 1948. 4 figs.

1697. Endometrial Tuberculosis. (Tuberculose do endométrio.)

By A. Campos da Paz Filho. Med. Cirurg. Farm., No. 144, 163-175, Apr. 1948. 8 figs., 35

1698. Diagnosis of Tubal Tuberculosis without Clinical Signs. (Le diagnostic de la tuberculose tubaire inapparente.)

By J. VABOIS. C. R. Soc. franç. Gynéc., 18, 80-84, Mar. 1948.

1699. Tuberculous Salpingitis. Report of a Typical

By E. C. Veprovsky and G. Schaefer. Surg. Clin. N. Amer., 28, 513-516, Apr. 1948.

1700. Treatment of Acute Salpingitis and Pelvic Peritonitis with Sulphonamides. (Die Behandlung der akuten Salpingitis und Beckenperitonitis mit Sulfonamiden.)

By I. Falckenberg. Geburtsh. u. Frauenheilk., 8, 369-372, Apr. 1948. 3 refs.

New Growths of the Reproductive Organs.

1701. Method of Staining Vaginal Smears. (Método práctico de coloración de frotis vaginales.)

By R. PINEDA. Rev. esp. Obstet. Ginec., 7, 103-106, Mar.-Apr. 1948. 4 refs.

1702. Value of the Vaginal Smear in the Diagnosis of Genital Cancer. (Valor actual del diagnóstico del cancer genital por los extendidos vaginales.)

By R. G. HERRERA and J. M. E. MEZZADRA. Prensa méd. argent., 35, 771-772, Apr. 23, 1948. 16 refs.

1703. So-called Extragenital Chorionepitheliomata. (Zur Frage der sogenannten extragenitalen Chorionepitheliome.)

By G. Michel. Frankfurt. Z. Path., 59, 59-68,

Aug. 2, 1947. 1 fig., 43 refs.

This paper describes another case in which, like those of Prym and Symeonides, a large retro-peritoneal "chorionepithelioma" in a male was accompanied by an atrophied testis containing a scarred area devoid of tumour. There is no doubt that in these cases a small primary teratoma of the testis had undergone retrogression after having R. A. Willis metastasized.

1704. Hidradenomas of the Vulva. Report of Four Cases with an Evaluation of Them in the Light of Analogous Breast Lesions.

By J. A. CUNNINGHAM and J. HARDY. Sth. Surg.,

13, 831-838, Nov. 1947. 5 figs., 3 refs.

This paper describes four examples of papillary cystic hydradenoma or sweat-gland tumour of the vulva. Impressed by the structural resemblance of these growths to intraductal papillary tumours of the breast, the authors suggest that the vulval apocrine and sweat glands are developmentally akin to the mammary glands. [This suggestion is not new, and, like many others with phylogenetic implications made by clinicians and pathologists, is purely speculative.] R. A. Willis

1705. Hydradenoma and Hydradenocarcinoma of the (Hidradenoma e hidradenocarcinoma da vulva.)

By D. Duarte. Rev. Ginec. Obstet., 1, 256-260, Apr. 1948. 1 fig., 9 refs.

1706. The Prophylaxis of Recurrent Carcinoma of the Vulva. [In English.]

By P. Malpas. Acta radiol., Stockh., 28, 681-

690, Nov. 13, 1947. 9 refs.

Recurrences of vulval carcinoma fall into two groups, early and late, appearing either earlier or later than 2 years after radical treatment. This division, according to the author, is justified by the difference of origin of these types of recurrence. Prophylaxis of early recurrence in the vulva itself is by adequate radical excision. The author advocates for this primary operation removal of the vestibule, lower urethra, lower vagina, and a wide area of perineal skin as far back as the anus; the wound is allowed to heal by granulation and no attempt is made to refashion the urethral orifice. Remote metastases in iliac lymph nodes and other organs appear within a few months of radical treatment; if there is no local recurrence it means that radical treatment was instituted too late. Inguinal metastases can be prevented by thorough and complete bilateral inguinal adenectomy. This is

carried out in two stages, the unaffected side being dealt with first. The commonest site of recurrence is at the inner end of the inguinal scar, and to minimize this the author advocates a planned incision extending from about 1/2 in. (1.25 cm.) below the inguinal fold and bifurcated at its inner end, one branch extending across the pubic spine to meet the incision of the opposite side at the upper border of the symphysis pubis, and the other extending down to form part of the vulvectomy wound. The wounds are allowed to heal by second intention. Late recurrences always appear in the vulva itself, and they remain local in character. Often the rate of growth is slower than that of the primary. The author is inclined to the view that the local recurrences are in the nature of fresh growths, and that such lesions should be excised. Figures are included giving the total 5-year survival rate. Eleven patients were alive without recurrence after 5 years, and 8 were alive with recurrence, giving a total of 19 out of 38 patients alive after T. Keith Morgan 5 years.

1707. Carcinoma of the Clitoris. (Carcinoma da clitóride.)

By Monteiro and A. A. Quinet. Obstet. Ginec. lat.-amer., 6, 75-91, Mar.-Apr. 1948. 5 figs., 20 refs.

1708. Vaginal Fibromata. (Les fibromes du vagin.) By G. Kropff. Bull. méd., Paris, 62, 209-216, May 1, 1948. 2 figs., 18 refs.

1709. Primary Epithelioma of the Vagina. (Epitelioma primitivo de la vagina.)

By A. BERGENFREID. Bol. Soc. chil. Obstet. Ginec., 12, 295-296, Nov. 1947.

1710. A Study of Cystic Pneumatosis of the Vagina. (Contributo allo studio della pneumatosi cistico della vagina.)

By A. BLASI. Arch. Ostet. Ginec., 53, 120-134,

Mar.-Apr. 1948. 6 figs., 30 refs.

1711. The So-called Botryoid Sarcoma of the Vagina in Childhood. (Sui cosidetti sarcomi a grappolo della vagina nell'infanzia.)

By A. FASANOTTI. Arch. Ostet. Ginec., 53, 80-104, Mar.-Apr. 1948. 7 figs., Bibliography.

1712. Two Cases of Axial Torsion of a Uterus with Fibroids. (A propos de deux observations de torsion axiale d'un uterus fibromateux.)

By F. Poilleux, —. Legende, and —. Koskas. Gynéc. et Obstét., 47, 335-338, 1948.

1713. Roentgen Therapy in Uterine Fibromyoma without Ovarian Sterilization.

By G. E. PFAHLER. Amer. J. Roentgenol., 58,

798-804, Dec. 1947. 12 refs.

The author records 4 cases of uterine fibromyomata treated successfully by X-ray therapy with ovarian protection. This treatment was followed by pregnancies and the delivery of normal babies. Up to 20 years later the children showed

no abnormality. He does not propose this treatment as an alternative to myomectomy, but suggests its use in cases where there are small interstitial fibromyomata and where hysterectomy is the only alternative. In his view the X-rays act directly upon the tumours and not necessarily or primarily upon the ovaries. He briefly surveys the literature of X-ray therapy for fibromyomata in general, and finds confirmation of his view that uncomplicated tuniours can be successfully treated by this means.

The 4 cases recorded are of particular interest in that the original irradiation was given respectively in 1915, 1924, 1938, and 1935; in only I case did amenorrhoea follow the treatment, and all but I of the patients subsequently had one or more healthy children. Details of the technique and dosage are given, but in general only the median portals were used and the ovarian areas were protected by lead filters. The fibroids disappeared completely, and Macfarlane is quoted on the improbability of carcinoma developing in the uterus after radiotherapy for fibroids.

Hugh R. Arthur

1714. Cardiovascular Syndromes in Uterine Fibromyomatosis. (La sindrome cardiovascolare nella fibromiomatosi uterina.)

By F. CASSANO and C. CONTI. Monit. ostet. gincc., 19, 22-82, Jan.-Feb. 1948. 10 figs., Bibliography.

1715. Structure and Pathogenesis of Polypoid Tumours of the Uterus. (Considerazioni sulla struttura e sulla patogenesi dei tumori polipoidi dell'utero.)

By S. PRINCIPE. Monit. ostet.-ginec., 19, 13-21, Jan.-Feb. 1948. 2 figs., 8 refs.

1716. Comparative Value of Deep and Supervoltage Roentgen Therapy. Statistical Analysis of Five Year Results in Selected Groups.

By T. LEUCUTIA. Amer. J. Roentgenol., 58, 347-

356, Sept. 1947. 15 refs.

The results of 15 years' experience of supervoltage therapy at Harper Hospital, Detroit, are discussed. Physical investigations show that a greater depth dose is attained than with deep X-ray therapy, so that skin reaction is diminished, irradiation is more homogeneous, and fewer ports of entry are required. A review of the literature reveals improvements in the results of treatment of carcinoma of the cervix, bladder, larynx, and rectum.

The present study is based on a series of 1,888 cases treated from 1923 to 1940, of which 1,038 received deep X-ray therapy and 850 supervoltage X-ray therapy. All cases are included, even where palliation only could be expected. The factors of supervoltage X-ray therapy were 500 kV (constant) 7 mm. Cu, 3 mm. Al, 3 mm. celluloid, half-value-layer 9 mm. Cu, intensity of 20 r per minute at 60 cm. skin-target distance.

A comparison is made of cases treated by both methods. No improvement in results was noted in cases of carcinoma of the tongue or thyroid and

D. M. Stern

only slight improvement in cases of carcinoma of bladder and larynx. Carcinoma of the cervix is treated by a combination of radium with X-ray therapy to supplement the dose at the periphery of the pelvis. With supervoltage therapy the 5-year survival rate has increased from 20 to 40 per cent. In cases of carcinoma of the fundus uteri treated by surgery combined with pre-operative and postoperative irradiation the 5-year survival rate is 50 per cent with supervoltage as against 40 per cent with deep X-ray therapy. In cases of carcinoma of the ovary postoperative irradiation gives a 5year survival rate of 17 per cent with deep therapy and 32 per cent with supervoltage therapy. The 5-year survival rate in inoperable cases of carcinoma of the rectum treated solely by X-ray therapy increased from 10 to 20 per cent. The author notes that less skin damage is observed with supervoltage therapy, and suggests that while it involves no new principle it is the irradiation method of choice for the small tumour located in a large volume of tissue. D. G. Bratherton

1717. Carcinoma of the Body of the Uterus. By R. A. McGill. J. Oklahoma med. Ass., 41, 177-180, May 1948. 13 refs.

1718. Carcinoma of the Body of the Uterus in Association with Fibroids. (El cáncer del cuerpo en las fibromatosis uterinas.)

By C. C. VERGARA. Ginec. Obstet. Mexico, 3, 115-128, Mar.-Apr. 1948. 14 figs., 12 refs.

1719. Chorionepithelioma of the Uterine Cervix. (Chorio-epitheliome du col utérin.)

By R. Rouchy. C. R. Soc. franç Gynéc., 18, 76-78, Mar. 1948. I fig.

, 1720. Cervical Erosion and Carcinoma. (Erosio colli uterig og carcinom.)

By W. Munck. Nord. Med., 38, 1115-1117, June 4, 1948. 21 refs.

1721. Simultaneous Cancer of the Cervix and Lesser Curvature of the Stomach. (Cancer double du col uterin et de la petite courbure de l'estomac.)

By C. Massias and Nguyen dinh-Hao. Bull. Ass. franç Cancer, 35, 125-126, 1948.

1722. Early Diagnosis of Cervical Carcinoma. By C. E. Galloway. Mississippi Valley med. J., 70, 93-97, May 1948.

1723. A Comparison of the Accuracy in Diagnosis of the Vaginal Smear and the Biopsy in Carcinoma of the Cervix.

By R. M. GRAHAM, S. H. STURGIS, and J. McGRAW. Amer. J. Obstet. Gynec., 55, 303-307, Feb. 1948. 12 refs.

Out of 181 cases of carcinoma of the cervix diagnosis was established in 148 by a positive vaginal smear (Papanicolaou) and positive cervical biopsy. There were 10 "false negative" biopsies and 17

"false negative" smears. In 3 cases both methods failed. There were three chief reasons for failure of biopsy: (1) tissue taken from the wrong area; (2) an error in interpretation of the specimen submitted; (3) not enough tissue taken for diagnosis. Vaginal smear may fail to establish the diagnosis because some tumours do not desquamate cells into the vagina. In others the cells may be present on the slide but may not be seen; lastly malignant cells may be misinterpreted as benign. By a combination of the two methods the correct diagnosis may be expected in 99 per cent of cases.

1724. Preinvasive Carcinoma of the Cervix Uteri. Seven Cases in which it was Detected by Examination of Routine Endocervical Smears.

By E. R. Pund, H. E. Nieburgs, J. B. Nettles, and J. D. Caldwell. *Arch. Path.*, 44, 571-577, Dec. 1947. 4 figs., 8 refs.

Seven cases are described in which pre-invasive carcinoma of the cervix was diagnosed by stained smears of the endocervix obtained by twirling a cotton applicator (throat swab) over the area, including any erosion. Staining was by the method of Papanicolaou (J. Amer. med. Ass., 1946, 131, 372), which offers the best method of detecting malignant cells in the circumstances. Each diagnosis was checked by biopsy. The authors, working in Georgia, U.S.A., are extending their study to determine whether all cancers of the cervix can be diagnosed in the early stages, and intend to compare results obtained on this basis with the incidence reported by Pund and Auerbach (J. Amer. med. Ass., 1946, 131, 960) of pre-invasive cancer in 3.9 per cent of 1,200 surgically removed cervices. In smears which suggest the presence of, or are positive for, cancer a biopsy or endocervical cureftage must be carried out. Magnus Haines

1725. The Microscopic Criteria for the Diagnosis of Early Carcinoma of the Cervix Uteri.

By E. E. Gurskis, D. C. Beaver, and H. M. Nelson. Surg. Gynec. Obstet., 85, 727-733, Dec.

1947. 8 figs., 5 refs.

Fifteen specimens of early carcinoma of the cervix uteri and the cellular changes in the pre-invasive stage are described. In some specimens the transition from normal to cancerous epithelium was abrupt, in others gradual. [The photomicrographs show undoubted carcinoma; the authors do not discuss the difficulties of distinguishing between early carcinoma and non-cancerous hyperplasias and metaplasias of the cervical epithelium.]

R. A. Willis

1726. The Use of the Vaginal Smear in the Diagnosis of Cancer.

By H. Ultelder. Connecticut med. J., 12, 513-514, June 1948. 10 refs.

1727. Prognosis in Carcinoma of the Uterine Cervix. By A. N. ARNESON. J. Tennessee med. Ass., 41, 195-205, June 1948. 9 figs., 8 refs.

1728. Is the Prognosis of Cervical Carcinoma Definitely Related to its Degree of Spread? (Ist die Prognose des Kollum-Karzinoms durch seine räumliche Ausbreitung eindeutig bestimmt?)

By H. REICHENMILLER, G. MUNST, and H. HAILE. Geburtsh. u. Frauenheilk., 8, 198-206, Jan. 1948.

2 figs., 13 refs.

It is usual to give a favourable prognosis in cases of carcinoma of the cervix in stages I and II and a less favourable prognosis in stage III, yet sometimes, even in stage I, the disease progresses rapidly and the prognosis is incorrect. The authors have endeavoured to find a more accurate manner of assessing the prognosis.

They investigated in various ways 631 cases of carcinoma of the cervix treated at the University Clinic, Tubingen. The patients were divided into three groups according to their state of health when they first came under observation: (1) cachectic; (2) apparently healthy; (3) without any specific feature. The majority of women in this group were of the peasant class, had lived a hard life, working long hours, and were thin and prematurely aged. One-sixth of the patients were in group I, one quarter in group 2, and more than half in group 3. The ultimate prognosis was poor in group 1. Only 25 per cent of those in stage I were alive at the end of 5 years, as against 11.8 per cent in stage II and 4.1 per cent in stage III. The prognosis in group 2 was better. In stage I the cure rate was 66 per cent, in stage II it was 42.6 per cent, and in stage III it was 27.3 per cent. The prognosis in group 3 was only slightly less favourable than in group 2. In stage I the cure rate was 49 per cent; in stage II, 41 per cent, and in stage III, 21 per cent. The authors conclude that the appearance of cachexia is associated with an unfavourable prognosis, no matter what the stage of the disease.

The relation between the age of the patient and the extent of the disease when the patient was first seen was also studied. The disease was nearly always more advanced in the old patient, who tended to seek advice late. The ultimate prognosis was better, however, in these patients than in women under the age of 35. The authors considered also the connexion between the age of the patient and the histological picture. The common tumour contained the undifferentiated one-cell type of flattened epithelial cell. This was present in over half of the cases. In patients between the ages of 41 and 50 the unripe proliferative flattened epithelial carcinoma, the unripe carcinoma with epithelial nests and columns, and the completely undifferentiated carcinoma are the common types. while in women aged 60 or over the ripe flattened carcinoma with cornification, the adenocarcinoma and the unripe carcinoma are the usual types. In

other words the more rapidly growing carcinoma occurs in the younger women and the more highly differentiated slow-growing tumour in the older women. Further investigations must be carried out before a more accurate prognosis in carcinoma of the cervix can be given.

Gladys Dodds

1729. Carcinoma of the Cervix: A Discussion on the Value and Techniques of Supplementary X-ray Therapy.

By J. G. WINTERNITZ et al. Brit. J. Radiol., 21.

27-40, Jan. 1948. 27 figs., 16 refs.

This paper describes the techniques of X-ray therapy now practised at 17 centres in Britain. and discusses their shortcomings in relation to overdosage and underdosage of the zones of irradiation by radium, where standardized techniques are used without regard to individual variations in The present method at the Royal each case. Cancer Hospital, London, is an ingenious development of that of Sandler, which attempted to fix, in relation to the pelvis, the volume-dose distribution for any given radium technique. By this method the authors attempt: (1) To assess the " summated dose " of both radium and X-rays at any given site. (2) To use this knowledge to plan the most suitable treatment for each patient, so as to avoid too high or too low a dose. (3) To enable the results of treatment to be assessed in the light of the tumour-dose received much more correctly than has been possible in the past. (4) To make it possible to judge whether there is any value in supplementary X-ray therapy in cases where carcinoma of the cervix has spread to involve lymph nodes. They employ a number of mechanical devices in their method, which are complicated to describe but which are probably simple to use.

[This paper represents a real advance in a subject in which there has been little progress for many years. The original paper, which is well illustrated, must be consulted for details of technique.]

B. Sandler

1730. Analysis of Technical Factors and Results of Treatment in Carcinoma of the Cervix Uteri. Description of Improved Radium Applicator.

By G. E. RICHARDS. Amer. J. Roentgenol., 58,

783–797, Dec. 1947: 6 figs., 5 refs.

The author sets out to answer four questions and to describe a new radium applicator for use in carcinoma of the cervix. First, he compares the best results of surgery with those of radiotherapy. The figures of Bonney and of Taussig are compared with those of the Manchester Radium Clinic for 1938 and with the Toronto figures for 1929-40, and the conclusion is reached that as regards absolute 5-year cure rate radiotherapy can show slightly better results than surgery and carries a lower primary mortality and morbidity. [This section is fraught with all the usual statistical difficulties of such a comparison and no mention is made of the place of surgery in the radio-resistant type of

tumour.] The second question is whether the technique of radiotherapy is at a standstill: the author compares the radiotherapy cure rate figures of various hospitals 15 years ago with those recently reported, and shows that there seems to have been an improvement of about 20 per cent in the Stage I and II cases and of 5 to 6 per cent in the Stage III cases during that period. The third question is the possibility of further improvement. He suggests that improvement may be achieved by: (1) more careful application of physical principles; (2) more skill in applying radium and combining it with X-rays; and (3) the use of new radioactive substances which are in process of development. Expanding the first point, he quotes Todd and Meredith and also Neary in describing the accurate planning of dosage from preliminary pelvimetry and the location of the points in the pelvis requiring maximum intensity of irradiation within the safety limit. He mentions points A and B, lying 2 and 5 cm. laterally from the cervix, and notes that the maximum dose at point A must not exceed 7,500 r because of the proximity of the ureter. He also notes that the maximum dose at point S, in the recto-vaginal septum, must not exceed 5,000 r. He himself designates the lateral pelvic wall as point C and states that the minimum effective dose at this point is 5,000 r. The author stresses that it is impossible to give a dose of 5,000 r or more to the lateral wall by the use of radium or X-rays 'alone and suggests a combination of both. favours X-ray therapy before the use of radium, because the bulk of the tumour is thus reduced and infection controlled before the radium is put in, and further, because an adequate test of the radiosensitivity of the tumour is made; he therefore advocates preliminary X-ray therapy in all cases except those in Stage I and some in Stage II. A full description of the deep X-ray therapy technique is given. The interval between X-ray therapy and radium therapy is discussed; in normal cases 3 to 4 weeks is considered optimal, otherwise the tumour may pass the stage of maximum regression and the cervix and vaginal vault may contract. With complications such as severe skin reaction or proctitis or cystitis the interval must be sufficient to allow these to settle down. The author criticizes present radium applicators as being inflexible, insecure, and dangerous to the operator and describes a new applicator. This consists, in its most recent form, of a nylon "bridge" containing radium at each end, having two holes in the middle of the bridge to receive a fork for holding the applicator in place and having a built-in filter of suitable material to protect the rectum; the claim is made that this reduces the intensity of radiation reaching the rectum by 25 to 30 per cent. The lower end of the fork protrudes from the vulva and is attached to a belt worn by the patient. A tandem intrauterine tube is used in conjunction with this applicator, and a self-retaining catheter is inserted

before the belt is finally fixed. The radium dosage is calculated in each case, having regard to the previous X-ray dosage, and is built up to give the maximum lethal or tissue-tolerance dose at the special points previously mentioned. In the average case the intrauterine applicator is loaded with 40 mg, in a 1-mm, platinum filter and the vaginal applicator with 30 m. x 2 in 1.5-mm. platinum filters, thus giving 3,500 mg. hours in 871/2 hours; a table shows the dosage in r units at the special points with this amount of radium, and two examples are given of total dosages of X-rays and radium. An isodose pelvic chart of final total doses is reproduced and a clinical chart for records is also shown. There is a final general note on the possible technique and dangers of new and more powerful radioactive substances.

Hugh R. Arthur

1731. Some Aspects of the Results of Radiation Treatment of Carcinoma of the Cervix Uteri.

By I. LAMPE. Amer. J. Roentgenol., 58, 651-662,

Nov. 1947. 2 figs.

This article discusses survival in patients with carcinoma of the cervix uteri by means of survival curves for a total number of 1,225 patients treated over 12 years. An attempt is made to classify the cases according to anatomical spread and histo- pathology, with a view to assessing the influence of these factors on end-results. The author concludes that with increasing anatomical extent of the neoplasm the survival rate decreases, but there is no evidence to show that the grades of histopathological differentiation have any marked influence. He also concludes that prediction of 5-year results by study of 3-year survival figures may be misleading. He introduces a new technique of "standardized curves". These are produced by determining the percentage frequency of distribution, as regards anatomical extent, in the whole series. This frequency is then applied to the cases for each individual year, so eliminating the influence of variation from year to year in the distribution of patients in various stages of the disease. The 5-year survival rate in 1,225 patients has risen from 20-25 to 40 per cent over a period of 12 years.

[This seems to be a successful method of assessing this factor, but account has not been taken of a factor equally important—the variation in size of the vagina and its effect on tumour dose delivered by vaginal radium—though the author mentions that contraction of the vaginal apex may prevent the use of routine applicators. Although attention was called some years ago to this factor (Sandler, Brit. J. Radiol., 1942, 15, 20, and Proc. R. Soc. Med., 1945, 38, 175), the author states that "the most important factor determining the probability of eradication of carcinoma of the cervix is the anatomical exent of the neoplasm". The evidence quoted suggests that vaginal size has an equally important effect (see also Lederman and Lamerton,

Brit. J. Radiol., 1948, 21, 11). It would seem that these tables are not completely standardized unless the factor of varying vaginal size is also eliminated.]

B. Sandler

1732. Rectal Hemorrhage following Irradiation for Carcinoma of Cervix.

By J. R. Johnston and H. W. Jacox. Amer. J. Obstet. Gynec., 55, 891-893, May 1948. 1 ref.

1733. A Rare Metastasis After Radical Operation for Carcinoma of the Cervix. (Eine seltene Metastase nach radikal operiertem Karzinom des Collum uteri.)

By F. NEMEC. Krebsarzt, 3, 213-216, June 1948.

2 figs., 2 refs.

1734. A Typical Endometrial Hyperplasia Simulating Adenocarcinoma.

By E. NOVAK and F. RUTLEDGE. Amer. J. Obstel. Gynec., 55, 46-63, Jan. 1948. 16 figs., 9 refs.

This is a paper on a subject which perplexes the practising gynaecologist from time to time—is the change seen in some tissue obtained by curetting atypical hyperplasia or adenocarcinoma? Normally the contrast between a carcinomatous area and the surrounding tissue is obvious, but atypical hyperplasia may make the diagnosis very difficult. Confusion may arise from increased number, crowding, and moderately atypical appearance of glands; stratification and abnormal staining of cells; and the presence of squamous plaques in the walls of the glands. The authors review 44 instances of these lesions and have correlated them with the clinical findings and histories.

[A very interesting article.] Kenneth Bowes

1735. Endometrial Changes Resembling Adenocarcinoma, Coinciding with Oestrin Treatment and Granulosa-cell Tumour of the Ovary. [In English.]

By J. CLEMMESEN. Acta obstet. gynec, scand.,

27, 384-389, 1948. 4 figs., 3 refs.

1736. Endometriosis.

By R. S. CRON. J. Iowa med. Soc., 38, 231-233, June 1948.

1737. A Study of Endometriosis. (Contribución al estudio de la endometrosis.)

By R. C. OYARZUN. Rev. mex. Cir. Cancer, 15, 313-320, Aug. 1947.

1738. Observations on the Study of Endometriosis in Mexico. (Contribucion al estudio de la endometriosis en México.)

By M. M. BASAURI. Gynec. Obstet. Mex., 3, 13-22, Jan.-Feb. 1948. 8 figs., 20 refs.

1739. Endometriosis of the Bladder.

By H. L. Tolson and B. SKITARELIC. Urol. cutan. Rev., 52, 144-147, Mar. 1948. 2 fig., Bibliography.

1740. Endometriosis of the Bladder. Report of a

By H. E. SCHMITZ and G. R. BABA. *Urol. cutan.* Rev., 52, 124-128, Mar. 1948. 17 refs.

1741. Endometriosis of the Ileum.

By A. B. Katz. Amer. J. digest. Dis., 15, 162-164, May 1948. 3 figs., 5 refs.

1742. Endometriosis as Cause of Small Bowel Obstruction. A Report of Three Cases.

By E. L. ZANDER, V. D'INGIANNI, and E. L. DREWES. *J. int. Coll. Surg.*, 11, 149-153, Mar.-Apr. 1948. 2 figs., 6 refs.

17.13. Endometriosis as a Cause of Obstruction of the Intestine.

By P. McGuff. *Proc. Mayo Clin.*, 23, 215-221, Apr. 28, 1948.

1744, Aberrant Endometrial Tissue and Intussusception.

By E. M. SOUTHERN. Brit. med. J., 1, 1178-1180, June 19, 1948. 4 figs., 16 refs.

1745. Endometriomata of the Sigmoid Colon Simulating Carcinoma.

By T. FARRAR. Memphis med. J., 23, 108-109, June 1948. 4 refs.

1746. Histological Studies of Chocolate Cysts. (Mikroskopische Studien an Schokoladenzysten.)

By A. Vogr. Geburtsh. u. Frauenheilk., 7, 48-56, and 87-94, Oct. and Nov. 1947. II figs., 34 refs.

The paper describes, with illustrations, a study of 50 chocolate cysts of the ovaries, in all of which endometrium-like glandular tissue was found. The appearance of this tissue varies. When completely enclosed by ovarian tissue the glands remain in the proliferative state, but when discharging into tarry cysts they show cyclical changes resembling those of the uterine endometrium. Serial sections disclosed tubal endometriosis in several cases. The author sees in his findings strong support for Sampson's hypothesis of the origin of tarry cysts. Disseminated foci in other parts of the pelvis often accompany tarry cysts of the ovaries.

R. A. Willis

1747. Conservation of Ovarian Tissue in Bilateral Ovarian Cysts. (La conservation du tissue ovarien dans les kystes de l'ovaire bilatéraux.)

By A. J. Bret. Rev. franç. Gynéc., 43, 133-136, Apr. 1948.

1748. The Granulosa Cell Tumour of the Ovary. Report of two Cases.

By H. K. TOPPOZADA. J. R. Egypt. med. Ass., 31, 230-241, Mar. 1948. 3 figs., 51 refs.

1749. Ascites and Hydrothorax with Lower Abdominal Tumours (Meigs's Syndrome). (Ascites en hydrothorax bij gezwellen onder in de buik. Het sydroom van Meigs.)

By G. BLOMHERT and L. P. KIAN. Ned. Tijdschr. Geneesk., 92, 1523-1532, May 22, 1948-48 refs.

1750. A Case of Dysgerminoma with Description of Recurrence.

By R. B. DURHAM, D. F. ADCOCK, and C. A.-SWEATMAN. J. South Carolina med. Ass., 44, 190-192, June 1948. 1 fig., 6 refs.

1751. Carcinoma Ovarii and Cerebellar Degeneration.

By B. Brouwer and F. G. Schlesinger. Proc. K. Akad Wet., Amsterdam, 50, 1329-1334, Dec.

1947. 6 figs., 12 refs.

Cases of subacute diffuse cerebellar degeneration are rare. Apart from the members of a single family, all the patients so far reported have also suffered from carcinoma. In the case here described a patient, aged 51, with ovarian carcinoma, began to show cerebellar symptoms about 15 months before death. Psychical disturbances were also present at the beginning but regressed. As in other reported cases the cerebro-spinal fluid contained an excess of protein and gave colloidal Postmortem reactions of mild paretic type. examination revealed a carcinoma of the left ovary with adnexa, with metastases in the neighbouring part of the abdominal cavity. The cerebellum showed no macroscopical evidence of disease, but microscopically there was complete disappearance of Purkinje cells, with relative preservation of baskets and almost complete integrity of the granular layer. The left dentate nucleus was severely degenerated, as were the ventral part of the right nucleus and to a minor degree the roof nuclei. No degeneration of inferior olives was seen. There was loss of many cells in the vestibular nuclei. Meningeal and perivascular infiltration in relation to the degenerated areas of the cerebellum and brain stem was present in this case as in other reported cases of this type. The authors consider that the metabolic disturbances associated with carcinoma affect parts of the central nervous system which are predisposed to degeneration by abiotrophy in Gowers' sense of the word. J. G. Greenfield

1752. Ovarian Metastases in Cancer of the Breast. (Les métastases ovariennes du cancer du sein.)

By —. Dargent, —. Papillon, and —. Guinet. Bull. Ass. franç. Cancer, 35, 4-19, 1948. 13 figs.

1753. Symptomiess Ovarian Metastases in Cancer of the Breast. (Métastases inapparentes ovariennes du cancer due sein.)

By P. Lamarque and G. Roux. Bull. Ass franç. Cancer, 35, 20-25, 1948. 4 figs.

1754. Arrhenoblastoma. (Zur Frage der Arrhenoblastome.)

By H. Gogel. *Krebsarzt*, 3, 182–190, May 1948. 2 figs.

1755. Corpus Luteum Cysts with Positive Aschheim-Zondek Test in Urine. Report of a Case. [In English.] By N. CLEMETSEN. Acta obstet. gynec. scand.,

27, 402-406, 1948. 8 refs.

1756. Fibromyoma of the Fallopian Tube. [In English.]

By T. Hølund. Acta obstet. gynec. scand., 27, 390-394, 1948. 1 fig., 15 refs.

1757. Lipoid Foreign-body Granuloma in the Fallopian Tube after Hysterosalpingography. (Uber ein Lipoid-fremdkerkörpergranulom im Eileiter nach Hysterosalpingographie.)

By H. OBWEGESER. Klin. Med., Wien., 3, 363-

375, May 15, 1948. 2 figs., 13 refs.

1758. Adenoma Tubulare Testiculare Ovarii.

By H. ANKER. Nord. Med., 38, 1124-1127, June 4, 1948. 2 figs., 8 refs.

1759. Sarcomatous Degeneration of a Fibroma of the Broad Ligament, (Dégénérescence sarcomateuse d'un fibrome du ligament large.)

By R. GENDRE, C. R. Soc. franç. Gynéc., 18,

85-86, Mar. 1948.

Operations.

1760. Anesthesia with Intravenous Pentothal Sodium and Local Nerve Block in Gynecologic Surgery. By J. C. McCann. New Engl. J. Med., 237,

931-936, Dec. 18, 1947. 5 figs., 5 refs.

This is the sixth of a series of papers by this author on the use of local nerve block with procaine to prevent the transmission of stimuli whose effects on respiration and muscular relaxation would otherwise necessitate the use of large amounts of "pentothal sodium" as a sole anaesthetic agent. Stimuli arising in the thoracic segments have the greatest reflex effects on respiration; when these effects are predominantly on the expiratory phase, there is increased tone in the muscles of the abdominal wall. In gynaecological surgery these segments are only stimulated during the actual opening and closing of the abdomen; during the rest of an operation such as hysterectomy the stimuli arise in lumbar and sacral segments, have a less violent effect on respiration and abdominal muscle tone, and can be blocked in their course through the utero-sacral ligament by 1 per cent procaine infiltration. This thesis is elaborated on the basis of 450 gynaecological operations (236 of them intraabdominal), in the course of which the rate of utilization of pentothal, the character of respiration, abdominal muscle tone, and sites of origin to reflex stimuli were examined in detail. It is concluded that the rate of utilization of pentothal is halved by the use of local nerve blocks in such operations.

1761. Surgical Treatment of Genital Prolapse. (Príspěvek k operační léčbě genitálního prolapsu.)

John Challis

By J. SYNEK. Ceskoslov. Gynaek., 12, 359-367, 1947. 4 figs.

The author describes his method of dealing with prolapse during the child-bearing years. It is essentially the same as Fothergill's (Manchester) operation, except that the sacro-uterine ligaments are also fixed to the sides of the uterus. In 68 cases the author has not observed any recurrence of prolapse, although in 4 of his earlier cases a cystocele recurred. A. Rohan

1762. Abdomino-perineal Construction of Artificial Vagina from Rectum. (Colporretoplastia abdominoperincal.)

By C. Salgado. An. brasil. Ginec., 13, 173-182, Mar. 1948. 2 figs.

1763. Construction of an Artificial Vagina from the Rectum by a Modified Schubert Technique. (Création d'un néo-vagin aux dépens du rectum suivant la technique de Schubert modifiée.)

By G. Cotte and P. Santy., Lyon chir., 43, 257-

265, May-June 1948, 15 figs.

1764. Culdoscopy, a Useful Gynecologic Procedure. By R. W. TeLINDE and F. RUTLIDGE. Amer. J. Obstet. Gynec., 55, 102-116, Jan. 1948. 14 figs., 6 refs.

From time to time the authors have observed the pelvic organs through a peritoneoscope. To overcome the disadvantages of that method, TeLinde in 1940 attempted to obtain a more direct approach by inserting the peritoneoscope through the posterior fornix, with the patient in the lithotomy position, but the result was not satisfactory. Decker in 1944 placed the patient in the knee-chest position so that air might be sucked into the peritoneal cavity to prevent the intestines from interfering with the view of the pelvic viscera. The authors have made frequent use of this method and report

their experience in 56 cases.

The instrument consists of a special trocar with a guard on the sheath about 3 cm. from the tip to prevent introduction of the trocar too far. culdoscope proper consists of a longer metal tube with ocular and objective lenses and a prism to deflect the light so as to make the abdominal contents visible through the ocular lens. distal to the objective lens is a small electric bulb, which is illuminated by a dry-cell battery. After careful bimanual examination the patient is placed in the knee-chest position in which she maintains herself or, if anaesthetized, is held (the authors use 2.5 per cent "pentothal sodium" as an anaesthetic). After vaginal and perineal cleansing the perineum is elevated, the vagina balloous out, air enters, and with a quick stab in the middle of the posterior fornix the vaginal mucosa and peritoneum are punctured easily. The obturator is withdrawn and if the tip of the cannula is in the cul-de-sac there will be an audible inrush of air. The sterile culdoscope is then introduced through the cannula. The uterus, tubes, ovaries, broad ligaments, uterosacral ligaments, infundibulo-pelvic ligaments, rectal wall, sigmoid, small intestine, and often the

caecum, appendix, and even the ureters may be seen. When examination is completed the culdoscope is withdrawn but the cannula is left in place as the patient assumes the recumbent lateral position. An assistant then presses on the abdomen until the air is exhausted from the abdominal cavity, after which the cannula is withdrawn. The wound in the cul-de-sac is not sutured.

The method has been used mostly in cases in which the history or findings suggested ectopic pregnancy, or in cases of salpingitis simulating tubal pregnancy. It has a useful place, however, in the study of cases of possible endometriosis. selected cases of severe dysmenorrhoea, cases of sterility in which all investigations prove negative. cases of undiagnosed unilateral lower abdominal pain, and cases of post-menopausal bleeding with normal pelvic findings after curettage. The chief contra-indication is the presence of a fixed pelvic Anthony W. Purdie mass.

1765. Surgery of the Cervix with the Electric Knife. By J. E. Wallace. J. Oklahoma med. Ass., 41, 186-191, May 1948. 7 refs.

1766. Conservative Surgery in Uterus Bicornis Unicollis. (La cirugia conservadora del útero monocervical bicorne.)

By R. G. REDONDO. Toko-ginec. pract., 7, 121-149, Apr. 1948. 16 figs., 3 refs.

1767. A New Method of Prevention and Treatment of Shock and Infection, with the Object of Lowering Immediate Mortality in Wertheim's Operation. [In Russian.]

By V. P. MIKHAILOV and A. P. TEREKHOVA.

Akush, Ginek., No. 6, 26-31, 1947.

This article embodies the results of 900 Wertheim hysterectomies for carcinoma of the cervix performed in the last 23 years. Details of the stage in which the operation was performed are given for 800 cases-113 patients were in Stage I, 252 in Stage II, 285 in Stage III, and 150 in Stage IV. A more detailed analysis of 751 of these cases is then The over-all primary postoperative presented. mortality was 15.6 per cent (shock 3 per cent, peritonitis 6 per cent, other causes 6.6 per cent). The cases are subdivided into three series: (1) 443 operations (1924-42) with 71 primary deaths, 122 recurrences, and 67 patients alive and well 5 to 18 years after operation; (2) 228 operations (1939-42) with 36 primary deaths, 59 recurrences, and 46 patients alive and well 5 to 71/2 years after operation; (3) 80 operations with no primary mortality and, so far, no recurrences. Except for the first 200 cases, all the operations were performed under local analgesia, and in most cases penicillin (100,000 units per litre) was added to the procaine solution as a prophylactic measure against sepsis. No cases of pneumonia occurred among the cases operated on under local analgesia. Shock was invariably present at that stage of the operation when the

uterus and lymph nodes are being dissected out of the pararectal pelvic tissue just before the final removal, and the authors consider that the best method of combating it is to inject intravenously at that moment 2 ml. of a I per ceut solution of morphine hydrochloride and to give a blood transfusion throughout the operation whether signs of shock are manifest or not.

Nicolas Tereshchenko

1768. Experiences and Technic in Vaginal Hysterectomy.

By A. F. Lee. Northw. Med., Seattle, 47, 350-354, May 1948. 7 figs., 5 refs.

1769. Flap Method of Supravaginal Hysterectomy. [In Russian.]

By S. B. GOLUBCHIN. Akush. Ginek., No. 2, 20-24, 1948. 2 figs.

1770. Current Reappraisal of Total Abdominal Hysterectomy.

By W. J. REICH and M. J. NECHTOW. Amer. J. Surg., 75, 670-676, May 1948. 12 figs.

1771. Aneurysm of the Uterine Artery After Subtotal Hysterectomy. (Anévrysme artériel de l'artère utérine après hystérectomie sub-totale.)

By J. A. PHELIP. Mcm. Acad. Chir., Paris, 74, 365-366, May 5-12, 1948

1772. Tubal Ligations. A Study of 351 Cases. By R. J. STOKES. *Bol. Asoc. méd. P. Rico.*, 40, 104-108, Mar. 1948. 20 refs.

1773. Influence of Some Gynaecological Operations on Ureteric Function. [In Russian.]

By Y. V. Gubinski: Akush Ginek., No. 2, 15-19, 1948. 2 figs.

1774. Transvaginal Ureterorectal Anastomosis with Partial Cystectomy: Case Report.

By H. D. Wolf. J. Urol., 59, 182-192, Feb.

1948. 10 figs., 2 refs.

The effective treatment of malignant disease of the body of the bladder is a matter of time, but in the case of the trigone of the bladder it is a matter of technique. In the former situation an early growth is disposed of by a partial cystectomy; in the latter situation the involvement of the ureteric orifices or of the internal meatus necessitates some form of urinary diversion. This means that in any case where removal of the growth by cystectomy is undertaken the ureters must be transplanted. In 1935 Hunner first performed transvaginal hysterectomy, cystectomy, and uretero-rectal anastomosis. He reported the case in 1937; it is the only one recorded in the literature. The present author now reports a similar case of transvaginal ureterorectal anastomosis with partial cystectomy for an infiltrating carcinoma of the trigone involving the vesicle orifice. The growth approached to within 1 cm. of the right ureteric orifice and to within 1.5

cm. of the left ureteric orifice. The operation was performed per vaginam after a midline episiotomy. Cystectomy was complete except for a small portion of the posterior wall of the body of the bladder. After the ureters had been freed, they were transplanted into the rectum under direct vision through a proctoscope. The would in the anterior vaginal wall was completely closed, the remaining plaque of the bladder being grafted in. For the ureteric transplantation the usual technique and after-care as for a uretero-sigmoidostomy were followed. The technique of the operation is shown in a series of drawings. At present the patient considers herself well. She has, however, developed herniation of the anterior vaginal wall. James Kemble

1775. The Studdiford Operation for Stress Incontinence in Women. (A operação de Studdiford na incontinência urinária feminina de esforco.)

By J. A. DE BRITO and O. VAZ. *Med. Cirurg. Farm.*, No. 144, 144-162, Apr. 1948. 9 figs., 19 refs.

1776. The Treatment of Vesicovaginal Fistula. By J. D. Guess. *Urol. cutan. Rev.*, **52**, 157-159, Mar. 1948. 5 refs.

1777. Uretero-vaginal Fistula. [In English.] By I. MERENYI. Acta. urol., Budapest, 2, 58-61, 1948. 7 refs.

1778. Rectovaginal Fistula. By W. W. PYLE. J. Tennessee med. Ass., 41,

135-136, Apr. 1948. 4 refs.
1779. A Condemnation of Resectoscopic Procedures

upon the Female Vesical Neck. By H. S. EVERETT. Urol. cutan. Rev., 52, 121-

124, Mar. 1948. 6 refs.

Urology

1780. The Role of the Cystoscope in Gynecology. By I. W. Kahn. *Urol. cutan. Rev.*, **52**, 152-156, Mar. 1948.

1781. The Urinary Disturbances in the Woman, Dependent upon her Genital Apparatus.

By L. F. Rodriguez Molina. *Urol. cutan. Rev.*, 52, 131-136, Mar. 1948. 13 figs.

1782. On a Case of Accessory Ureter with an Extravesical Ectopic Orifice, and the Clinical Problems Arising from this Abnormality. (Uber einen extravesikal mundenden akzessorischen Ureter und die klinischen Probleme dieser Missbildung.)

By G. Lange. Z. Urol., 40, 207-246, 1947. 10 refs.

The author describes a case of "ureteric incontinence" (Posner) due to the presence of an accessory ureter with an ectopic opening in the vagina. The patient, a girl aged 5, suffered from involuntary evacuation of urine, despite the apparent presence of sphincteric control, and intermittent voiding of bladder contents. Examination showed the loss

to come from the vagina, but cystoscopy demonstrated the presence of normally functioning right and left ureteric orifices in the bladder. These findings, together with a pyelographic abnormality in the lower part of the course of the left ureter, suggested the diagnosis of an accessory ureter on the left side opening into the internal genital organs. This was confirmed at laparotomy (at the age of g). The accessory ureter, which drained a separate pelvis at the upper end of the left kidney, was seen to communicate, through a dilated caudal extremity, with a small opening in the left anterior vaginal wall. The ectopic ureter was transplanted into the bladder. Although subsequent progress was satisfactory and incontinence ceased, the implanted ureter was apparently non-functional 2 years later.

A comprehensive review is given of the varieties of accessory and ectopic ureter, including one reference to caudal duplication. The Meyer-Weigert law affecting the position of ectopic ureteric orifices is recapitulated, and lengthy consideration given to the embryological aspects of duplication. Ahlfeld's theory of abnormal fission of the ureteric bud, and Felix's theory based on the observation of several ureteric buds arising from one Wolffian duct (a normal occurrence in some lower vertebrates) are discussed. It is apparent from Chwalla's observations that caudal duplica-

tion cannot arise from fission, and must be ascribed to the cranial confluence of two ureteric buds. The remainder of the paper is given up to a statistical review of ureteric abnormalities, and a consideration of their clinical manifestations. Treatment of cases similar to the one recorded is considered under the headings of: (a) hemi-nephrectomy and ureterectomy; (b) total unilateral nephro-ureterectomy; and (c) implantation of the ectopic ureter into the bladder (preferably extraperitoneally). The latter is recommended, but functional results may be disappointing.

J. D. Fergusson

1783. Bleeding of Vesical Origin in the Menopause Confused with Uterine and Rectal Bleeding.

By I. C. Rubin. *Urol. cutan. Rev.*, **52**, 130-131, Mar. 1948.

1784. Vesical Neck Obstruction in the Female. By J. S. RITTER and L. A. SHIFRIN. Urol. cutan. Rev., 52, 147-149, Mar. 1948. 9 refs.

1785. Primary Malignant Melanoma of Female Urethra.

By J. SAVRAN, E. A. SAYER, and C. E. SCHRADIACK. *Amer. J. Surg.*, 75, 743-745, May 1948. 2 figs., 7 refs.

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# FUNCTIONING TUMOURS OF THE OVARY, WITH SPECIAL REFERENCE TO PATHOLOGY AND HISTOGENESIS\*

BY

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My first pleasant obligation, and certainly not a merely conventional one, is to express my great appreciation of the honour of being invited to deliver this address before your distinguished College. I am proud to be the first of my countrymen to fill this new lectureship, which the generosity of one of your Fellows has made possible and which should do much to bind even more closely the followers of our specialty in our two countries. I am also deeply grateful to you for bestowing upon me the Honorary Fellowship of the Royal College, an honour which I can assure you I shall always cherish. It is not false modesty on my part to feel that this distinction is intended as a friendly tribute to American gynaecology and obstetrics, no less than to any very modest contributions of my own in our common field of endeavour. Many of your own distinguished leaders have appeared

The choice of my title is easily explained by the fact that, while my interests have always been primarily clinical, my scientific hobbies, if one may use such a term for interests which are such important, and such integral, parts of one's daily clinical work, have been in the fields of pathology and endocrinology.

The tumours which I propose to discuss to-day are of great clinical importance in spite of their comparative rarity, but their pathologic characteristics are of rather special nature, and not as widely recognized as are those of many other neoplastic types. The fact that these tumours have the capacity of producing striking sex changes, because of their hormone-producing capacities, surrounds them with a sort of scientific glamour not possessed by other ovarian tumours.

A final consideration in the selection of my title lies in the fact that I have had the

before the national societies of our country, and the names of not a few are inscribed among our honorary fellows.

<sup>\*</sup>Biennial Anglo-American Lecture, read before the Royal College of Obstetricians and Gynaecologists, on 1st October, 1948.

opportunity of studying material from an unusually large number of tumours of the type I am to discuss. Only a small fraction of this material comes from our own clinic. For that matter no one clinic in the whole world can boast of a very imposing number comparatively these uncommon tumours. However, a large number of cases have been made available to me through the fact that material has been sent in for diagnosis from many other clinics in our own country, as well as others. During the past four years, moreover, the Ovarian Tumor Registry, sponsored by American Gynecological Society, brought to us an ever-increasing amount of ovarian tumour material, including a surprisingly large number of functional ovarian tumours. This material is stored in our own laboratory, since I have served as the Chairman of the Ovarian Tumor Committee since its inception. Registry material will ultimately give us a rich storehouse of well-authenticated material, with complete clinical data, and a reasonably good follow-up. The large number of cases studied before the inauguration of the Registry are of more value for pathological than for clinical studies, since so many of them come from small hospitals from which it is extremely difficult to obtain satisfactory histories, much less follow-up reports.

No longer is the concept of functioning tumours of the endocrine glands a new one, and a considerable group of such tumours is now well recognized as producing characteristic clinical syndromes. The gigantism or acromegaly associated with eosinophilic adenoma of the anterior pituitary, the Cushing syndrome produced either by basophilic adenoma of the pituitary or adenoma of the adrenal cortex, the profound sex changes produced by certain tumours of the adrenal, and the characteristic syndromes associated with

tumours of the parathyroid and the pancreatic islands of Langerhans are among the better known examples of the biological effects of endocrine gland tumours.

In so far as the ovary is concerned, it has been established that hyperthyroidism may result from over-activity of the thyroidtissue contained in the ovarian teratomatous tumour known as struma ovarii. In the most recent report on this subject, Emge (1940) collected a good many instances of this sort, including the one observed by himself. With this group of functioning tumours arising from tissues alien to the ovary I shall not deal in the present paper, which will be devoted to certain functioning tumours made up of tissues intrinsic to the ovary itself:

It was Robert Meyer (1933) who, through a study of his own material, and a critical analysis of that included under various designations in the publications of previous authors, gave us a grouping of these "special" ovarian tumours, as he called them, which is still acceptable to-day. Moreover, he gave us what, on the whole, has proved to be a satisfactory working theory as to the histogenesis of tumours of this group. The importance of his contribution is not lessened by the fact that his original views on this point have, in spite of the canonical weight carried by his pathological prestige, seemed to require modification or supplementation on various points, as will be discussed later.

While my paper will include a brief discussion of some of these moot points as to histogenesis, it will concern itself even more with the characteristics of the tumours from the fairly well-established standpoint of their pathology. The clinical effects of these tumours are now quite well known, and will be included in this discussion simply for the purposes of correlation.

There are three ovarian tumour-types which are derived from cells dating back to

the very early phases of gonadal development. Two of these are of functioning nature, and one is endocrinologically inert, but it is difficult to exclude its brief discussion as a sort of background in the consideration of the other two varieties. Any intelligent concept of the nature and biological potentialities of these tumours presupposes at least some knowledge of early ovarian embryology, although even on this point our knowledge is still far from complete.

Endocrinologists, however, are agreed that, in its earliest phases, the ovarian anlage cannot be histologically differentiated from that of the testis. In this undifferentiated phase, certain cells may become segregated from the later differentiating processes going on in the gonadal area, remaining dormant and undifferentiated until postnatal life, when they may give rise to the tumour type to which Meyer gave the designation of dysgerminoma.

If the above explanation is correct, one would expect the resulting tumour to be lacking in endocrine effect, since the constituent cells date back to a phase in gonadal development when neither ovarian nor testicular characteristics had appeared. This is in conformity with clinical experience, as no case of dysgerminoma has been reported as producing endocrine effects. Some of the earlier observations on such tumours appeared to suggest such an influence. Quite a number were described as occurring in definitely intersexual individuals, including pseudohermaphrodites. However, after the removal of such tumours the individuals remain just as intersexual as ever. In other words the tumours have nothing to do with the production of the intersexuality, which is of the common congenital or genotypic variety.

Again, if the above-mentioned concept is correct, one would expect to find dysgerminomas in the testis as well as in

the ovary, and this is actually the case. The relatively common seminoma of the male gonad is histologically identical with the ovarian dysgerminoma. Indeed, in the French literature the latter is still quite generally spoken of as seminoma (Chevassu).

In a now considerable group of reported cases dysgerminoma has been found in association with unquestioned teratomatous elements, and I have seen a small group of such cases. This fact has led some to the view that dysgerminoma itself is to be explained as a teratoma, in spite of the fact that the overwhelming proportion of these tumours are histologically completely lacking in any of the usual teratomatous admixtures. For the present it would seem that we are justified in adhering to Meyer's original explanation of the origin of these tumours, since it conforms so completely with what we know as to their clinical characteristics.

The characteristic microscopic pattern is that of rather large, round or polyhedral cells arranged in alveoli, separated by septa of usually hyalinized connective tissue showing lymphatic infiltration (Fig. 1).

Since dysgerminoma is not a member of the functional group it does not seem necessary to dwell upon its clinical or pathological characteristics except in very cursory fashion. Such tumours occur characteristically in young patients (carcinoma puellarum), usually in the teens or twenties, sometimes later, but only rarely over 50. They are usually of small or moderate size, but may become very large, filling most of the abdomen, as in the very first case we encountered in our own laboratory, in which the patient was 7 years old.

They are primarily solid, but as they grow their necrotic tendency may produce small or large ragged cavities. The smaller tumours are well encapsulated and of

moderately firm or doughy consistency. As they grow, however, the capsule is apt to be penetrated, the tumour becoming widely infiltrative, this greatly increasing its clinically malignant potentialities. As a matter of fact, if there is any criterion for the selection of radical over conservative operation in the young individuals in whom such tumours characteristically occur, it would probably be this factor of large size and, even more important, local infiltration through penetration of the capsule.

The smaller well-encapsulated growths may be treated conservatively, with unilateral adnexal removal, and of course without postoperative irradiation in the young individuals of this group, often girls in their teens. However, it must not be assumed that cure invariably occurs in this favourable group, while recurrence is common in the infiltrative variety above described. We have recently observed a well-encapsulated dysgerminoma of the size of an orange, in which a radical operation was done, including hysterectomy and bilateral salpingo-oöphorectomy, although the patient was only 28 years old. Within 3 months the patient died of mediastinal metastasis, the autopsy showing no local recurrence in the pelvis.

In our own laboratory material we have studied 43 cases of dysgerminoma, although only a fraction of these were observed clinically in our hospital. A follow-up has been possible in only a fraction of our cases, and thus far the overall recurrence-rate of dysgerminoma would seem to be in the vicinity of 20 to 25 per cent, the figure arrived at by Novak and Gray (1938) in an earlier study of 17 cases from our laboratory.

# MASCULINIZING TUMOURS.

The early undifferentiated or neutral phase of gonadal development is followed

after 5 or 6 weeks by one in which the gonadal area shows evidence of differentiation, with the appearance of anastomosing sex cords made up of cells differentiated in situ from the gonadal mesenchyme. This statement is made rather arbitrarily, since it is now supported by convincing evidence. and is accepted by practically all embryologists. The former viewpoint, that the sex cords are produced by invagination of the surface epithelium, appears to have been largely abandoned, although there is still some doubt about the possible role played by certain accessory or secondary sex cords which have been described by Gruenwald (1942).

In the gonad destined to become a testis, the sex cords later, through canalization, become the seminiferous tubules, linking up with the mesonephric structures to form the complete testicular apparatus (tubules, vasa recta, rete and vas deferens, the latter course, derived from the being, of Wolffian or mesonephric duct). As we are more directly concerned with the ovary, it is important to emphasize that exactly the same testicular scaffolding is first laid down, that in the ovary this is evanescent, that it is succeeded by a second wave of more typically ovarian differentiation, but that vestiges of the original testicular structure may persist in the later life of the ovary. This is an over-simplification of these early embryonic changes, concerning some of which there is still some uncertainty, and which probably progress in more or less overlapping fashion. However, it conforms to accepted general principles, and is of service in the explanation and interpretation of the group of tumours under discussion.

The statement made above to the effect that the medulla of the ovary contains vestiges, at times demonstrable even histologically, of cells which started off along testicular lines, justifies the frequent state-

ment that there is a potential testis in every ovary. It is from these potentially testicular cells, according to the concept of Meyer, that neoplasms may arise which, as might be expected, reproduce testicular histology to some degree or other, and which, through the production of the testicular hormone, exert a masculinizing effect upon the female organism.

Attractive and rational though this theory may be, it is only a theory, and it cannot be accepted without question. has always seemed to me that we cannot close our eyes to the very intimate relation, in the early phases of embryonic life, of the ovarian medulla and the adrenal cortex. These virtually blend one with the other, and it is therefore not surprising that the effects of arrhenoblastomas and of certain adrenal cortical tumours are quite similar. This still does not explain the origin of arrhenoblastoma satisfactorily, although it would be highly suggestive as regards the histogenesis of the so-called adrenal rest tumours of the ovary. The arrhenoblastomas, on the other hand, tend to reproduce testicular structure, so that an origin from testicular or pro-testicular structures would seem more likely.

Nor are these the only hypotheses which have been advanced on this point. As already stated, embryologists now believe that the gonadal mesenchyme is embryologically the mother tissue from which both testicular and ovarian elements are derived. and this would apply not only to such parenchymal structures as seminiferous tubules and ovarian follicles, but also to the interstitial or stromal elements of both testis and ovary. The stroma might therefore be expected to retain a great deal of differentiating potency, in fact a totipotency in so far as differentiation into either masculine or feminine elements is concerned. An increasing number of authors, therefore, have stressed this latent mesenchymal differentiating potency as explaining the testicular character of certain ovarian tumours.

This theory is not very different from that of Meyer in so far as arrhenoblastoma is concerned, but it can be extended, and has by some been extended, to explain the masculinizing group of tumours variously described as adrenal tumours of the ovary, masculinizing luteoma, masculinovoblastoma or virilizing lipoid cell tumours. believes 1946) (1944, tumours of this group are really to be interpreted as interstitial or Leydig cell tumours, their characteristic adrenal-like cell constituents arising from the ovarian mesenchyme, which can give origin to any element of testicular structure. There can as yet be no general application of this concept, the evidence still indicating that most tumours of this group are really of adrenal type. In spite of the fact that at least a few masculinizing luteomas have been reported, I agree with Schiller (1933) that these are actually to be interpreted as adrenal in character. Since adrenal rests are rarely seen in the adult ovary itself the occurrence of such tumours would seem most logically explainable by embryological segregation or adrenal cells in the gonadal area, as a result of the embryological intimacy and continuity of the adrenal cortical and ovarian medullary areas in early development.

Another view, urged by Iverson (1947), is that the so-called adrenal tumours are really made up of luteinized theca interna cells. From the standpoint of mere morphology, there is no doubt that these theca cells can assume an appearance quite like that of the cells of the adrenal zona fasciculata, and it is difficult to avoid the feeling that they must have an important function, though no one knows what it is. It was these very theca cells, luteinized and hypertrophied in late stages of pregnancy,

which were at one time spoken of as the interstitial cells of the ovary (interstitial-druse) analogous to the interstitial or Leydig cells of the testis, a view for which no scientific support has ever been adduced.

Even in the non-pregnant woman one is often struck by the marked hypertrophy of this thecal layer surrounding atretic follicles, the cells becoming large and polygonal, with often an alveolar arrangement which increases their resemblance to adrenal cells. Culiner (1945) has even suggested that changes in these thecal cells may be responsible for menstrual disorders, but the evidence he furnishes is not convincing. I have recently examined sections of the ovaries from two infants, one 3 months old and the other 16 months old, in which this thecal change surrounding atretic follicles was very striking, and very reminiscent of adrenal cells. It would seem that only certain phases of atresia folliculi show this thecal responsiveness (Fig. 2).

We know too little as to the significance of these thecal changes in atretic follicles to justify any prolonged discussion, and they are mentioned here simply to emphasize that the ovarian mesenchyme, which is a progenitor of theca as well as of the granulosa, probably possesses differentiating potentialities which have not been fully appreciated. It is, as a matter of fact, not impossible that the histogenesis of the so-called adrenal tumours of the ovary is not from adrenal tissue inclusions in the ovary, but from cells in the ovarian mesenchyme itself. This view could obviously be extended to include that vague group of tumours designated by Rottino and McGrath (1939) as masculinovoblastoma, in which there is doubt as to whether the constituent cells are of adrenal or lutein type.

- Clinical. The effects of tumours of this

group are, as a rule, masculinizing, but in at least a minority of reported cases tumours which histologically conform to this variety have shown no endocrine effect whatever. This has been true in a number of very small tumours, sometimes microscopic in size, and this very factor of size and probably quantitatively slight hormone production would possibly explain the absence of sex changes. 'It is not so easy to understand why considerably larger tumours may at times show similar hormone inactivity, this being often the case in the small group of highly differentiated neoplasms, especially of the testicular adenoma variety described by Pick (1905). There are some pathologists, like Norris (1938), who question the justifiability of applying the name arrhenoblastoma to tumours which do not actually cause masculinization changes, but it appears wiser to use the pathological structure rather than the clinical effect as a criterion of classification.

The clinical history of such patients is quite characteristic. The first symptoms to appear are not of masculinizing nature, since they simply subtract certain typically feminine attributes from the woman's make-up. In the typical case, a woman who has previously been normal in every way, with normal menstruation and often with a history of one or more pregnancies, ceases to menstruate, shows regression in the size of the breasts, and often loss of subcutaneous fat around the hips, so that her figure becomes less rounded and at This last times even rather angular. mentioned change is naturally inconspicuous in the case of normally thin women.

All of these manifestations are to be looked upon as evidence of defeminization rather than actual masculinization, but they are followed, with some overlapping, by genuine stigmata of masculinization. These are represented by a change in voice;

hirsutism and hypertrophy of the clitoris. The deepening of the voice is due to actual lengthening of the vocal cords and hypertrophy of the laryngeal cartilages. The hirsutism affects the face, extremities, abdomen, buttocks, and perineum, and sometimes the chest and back. Similar hairy overgrowth is not uncommon in women who otherwise are typically feminine, with normal menstruation and fertility, so that hirsutism in itself is not necessarily an evidence of masculinization. In cases of the latter group we must postulate some disorder of the still unknown cortical or hypophyseocortical mechanism believed to regulate hair distribution. But when combined with voice changes and hypertrophy of the clitoris, hirsutism must be looked upon as a part of a masculinization syndrome (Fig. 3).

With removal of an arrhenoblastoma, the symptoms disappear much in the order of their appearance. Menstruation is reestablished rather promptly, usually within a month, but in some cases much earlier. The breasts soon regain normal size, and there is a re-deposition of subcutaneous fat about the hips and lower abdomen.

But the positive stigmata of masculinization are more fixed, and they disappear far more slowly and often incompletely. In one of my cases both the voice change and hirsutism disappeared in scarcely more than a year, probably because of the comparatively short duration of the disorder. In another patient, with a longer history, and more pronounced changes, the hirsutism after 2½ years is much less marked, but still a problem, the patient shaving only 3 times a week instead of twice daily, as she did formerly. The voice is still quite deep. The hypertrophy of the clitoris in such cases is also likely to persist, but this is rarely a serious problem. since removal of this organ is so easily done when the overgrowth is very pronounced.

This procedure was carried out in the second of the patients mentioned above (Figs. 4 and 5).

All tumours of this group should be looked upon as at least potentially malignant, although recurrences have been reported in only a comparatively small group. This may well be explained by the fact that the rather spectacular clinical history leads to a report of these cases soon after operation, with no later report of the ultimate result. My impression, based on the cases in our own material, as well as those in the literature, is that the recurrence rate will probably approximate 20 per cent, although we hope to have more precise statistics when a larger number of cases is accumulated in the Ovarian Tumour Registry.

The fundamental consideration in discussing the microscopic pathology arrhenoblastoma is that this represents an imperfect and abortive attempt at the formation of testicular structure. minority of cases the microscopic appearance is a reasonable approximation of testicular histology, with the formation of tubules not unlike the seminiferous tubules. sometimes a good reproduction of the rete testis, and not infrequently islands of cells which by their morphology and their lipoid content are identical with the Leydig Arrhenoblastomas of this highly differentiated variety include the so-called testicular adenoma of the ovary described as far back as 1905 by Ludwig Pick, long before the term arrhenoblastoma had been coined (Fig. 6).

At the other extreme there are tumours so highly undifferentiated as to be indistinguishable from sarcoma, although meticulous examination of perhaps many blocks will commonly reveal areas in which the cells are arranged in zig-zag and anastomosing cords which resemble the sex cords of the early embryonic stage of

testicular development. Such tumours may likewise show an occasional tubule, not at all resembling a typical seminiferous tubule, and representing only an exceedingly abortive attempt at formation of the latter (Fig. 7).

The largest number of cases are of socalled intermediate variety, with usually many tubules, numerous sex cords, not infrequently islands of interstitial cells, and a matrix of fibrous tissue of varying degrees of consistency, but sometimes so dense and compact as to resemble fibrosarcoma (Fig. 8).

It is obvious, therefore, that no stereotyped description of the histology of these tumours can be given, and that the term arrhenoblastoma refers to a whole series of histological gradations between the highly differentiated testicular adenoma and the very undifferentiated sarcoma-like variety.

# FEMINIZING TUMOURS.

As already stated, the primarily testicular scaffolding laid down in the early development of the ovary soon fades out and is followed by a second and typically feminine wave of differentiation, originating like the first in situ, as now generally accepted. From the mesenchyme are differentiated broad cords of cells which develop the primitive follicle apparatus. Around each germ cell or oögonium a rosette of satellite cells arranges itself, the future granulosa. We are not here concerned with the origin of the germ cells, and whether they are derived from the germinal epithelium or whether they migrate to the gonadal area by way of a "Keimbahn" from a much earlier situs in the hindgut.

According to Meyer's concept redundant rests of granulosa cells are left over in this process of follicle formation, and from such rests tumours may arise in later life. Such tumours, derived from cells already of feminine type, would be expected to exert feminizing effects. The weight of evidence, however, is against the correctness of Meyer's theory of the origin of these tumours. It does not, for example, offer any explanation of the histogenesis of the type of feminizing tumour designated as thecoma. It seems certain that the origin of both granulosa-cell tumours and thecomas must be referred to ovarian mesenchyme, which is the mother-tissue of both granulosal and thecal cells. arising in this progranulosal and prothecal mesenchyme may be either epithelial (granulosal-cell tumours) or connective tissue (thecoma) in type, or they may be composed of both types of cells (granulosathecoma), as they so often are. It must be remembered that in the ovary, as in the genital tract, both epithelium and connective tissue are derived from the same embryonic layer, the mesoderm, so that it is not surprising that there is a greater degree of kinship and probably intermutability between these two types of tissue than pertains to most other areas of the body.

An interesting, but as yet mystifying, observation has been the fact that granulosal and, at times, thecal tumours can be produced in the ovaries of certain animals, especially the mouse, by means of light irradiation, as shown in Figs. 9 and 10. When this observation was made the suspicion was at once voiced that perhaps the same aetiology might be concerned in the human tumours of this group, a suspicion for which there is no substantiation in the previous histories of patients with such tumours. The immediate importance of such studies is that they clearly indicate the mesenchymal origin of these tumours, which may histologically assume granulosal, thecal or lutein characteristics, with usually a mingling of these types.

Another exceedingly interesting but also still unexplained observation is that tumours of this type develop spontaneously

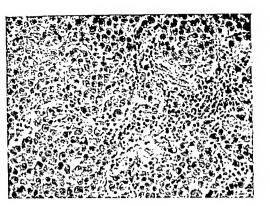


Fig. 1. Characteristic and not easily mistaken microscopic pattern of dysgerminoma.



Fig. 3. Extensive hirsutism in a patient with arrhenoblastoma (author's case).

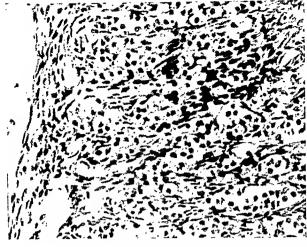


Fig. 2.

Theca-cell changes morphologically resembling adrenal tissue in ovary of infant of one month.



Fig. 4.

Recent appearance of same patient as shown in Fig. 3. In spite of the fact that she had shaved shortly before being photographed (now shaves three times a week instead of twice daily), her features seem definitely more feminine than formerly.

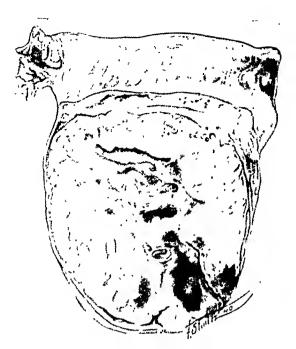


Fig. 5.
Gross appearance of arrhenoblastoma removed from patient shown in Fig. 3

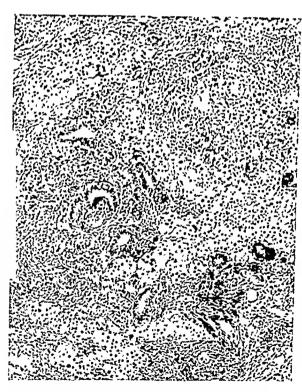


Fig. 7.

Intermediate variety of arrhenoblastoma, showing large fields of pale-staining cells which by their morphology and their lipoid content resemble Leydig cells of testis.

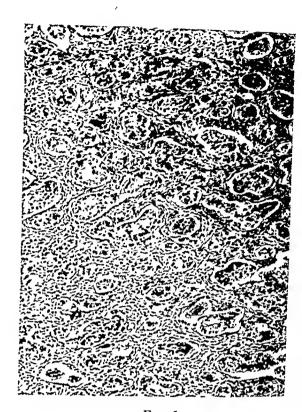


Fig. 6.
Microscopic appearance of arrhenoblastoma showing tubular structure imperfectly suggesting that of testis.



Fig. 8.
Undifferentiated type of arrhenoblastoma showing cord-like arrangement suggesting primitive sex cords.



FIG. 9. Partly luteinized granulosal tumour in ovary of irradiated mouse.



Fig. 10. Precocious puberal changes, including menstruation, in coloured child aged 7. (Novak, Textbook of Gynecology, 3rd edition, 1948, Williams and Wilkins Co.)

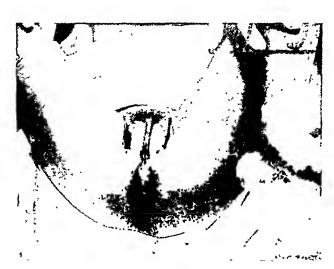


Fig. 11. Puberal appearance of external genitalia in child shown in Fig. 10. (Novak, Textbook of Gynecology, 3rd edition, 1948, Williams and Wilkins Co.)



FIG. 12. Microscopic appearance of granulosa-cell tumour, showing the cluster-like, folliculoid arrangement of the cells and the Call-Exner bodies.

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Fig. 13.

Cylindromatous pattern, a very common one with granulosa-cell tumour, although many others are observed.

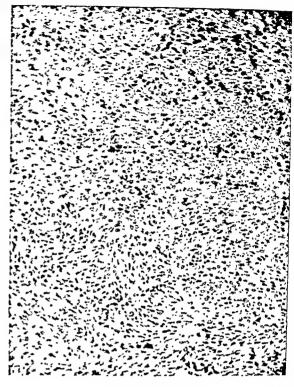


Fig. 14.
Thecoma of ovary.

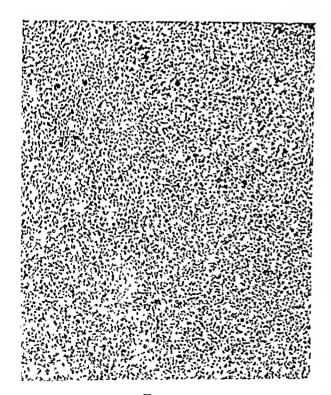


Fig. 15.

Thecoma with admixture of granulosal cells (granuloso-thecoma).

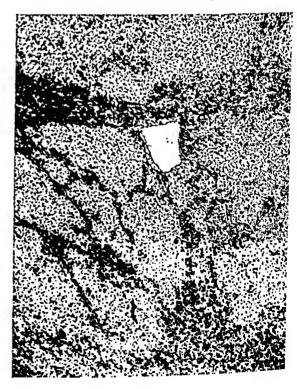


Fig. 16.

Granulosa-cell tumour with extensive luteinization (folliculome lipidique).

in intrasplenic implants of ovarian tissue in castrated animals. The location of such grafts in the spleen makes it quite certain that the oestrogen they produce is destroyed in the liver, according to the best evidence as to the oestrogen-destroying capacity of the liver. Just why this should lead to the formation of granulosa- or lutein-cell tumours is not clear. Various hypotheses have been suggested, such as that the responsible factor is the unopposed action of the FSH principle upon the implanted ovarian tissue. This, however, is an explanation which does not explain, as there is no evidence to suggest that excessive or unopposed gonadotrophic action of this sort can induce tumour formation.

Whatever the explanation may prove to be of these tumours in intrasplenically grafted ovaries, their occurrence again points to an origin from the interfollicular portion of the ovarian mesenchyme, just as was mentioned concerning the tumours produced by irradiation.

Clinical characteristics. The clinical effects produced by the granulosal and thecal group of tumours are just what one would expect if one bears in mind that they produce oestrogen. When they develop in infants or very young children, at a period long before the normal inauguration of the oestrogenic function of the ovary, the clinical picture evoked is that of precocious puberty. The development of the secondary sex characters at normal puberty is unquestionably due to the initiation of oestrogen-production of the ovary (Figs. 10 and 11).

One could expect, therefore, that the production of considerable amounts of oestrogen in a prepuberal child would bring about such puberty changes as development of the breasts, the growth of pubic and axillary hair, a feminine rounding of the body contour, development of the pudenda, hypertrophy of the uterus,

and a periodic, menstruation-like type of uterine bleeding. Whether we prefer to call this bleeding menstruation or pseudomenstruation, it is of the purely oestrogen-induced type, and not associated with ovulation. In this important respect the precocious puberty induced by feminizing ovarian tumours differs from the far more common variety designated constitutional. For a fuller discussion of the distinction between the two, as well as of constitutional precocious puberty in general, the reader may be referred to a previous publication by the present author.

The removal of the ovarian tumour producing the precocious developmental changes in young children is followed by a prompt regression of the symptoms, including a cessation of menstruation. The rather spectacular clinical picture in cases of this sort leads to early resort to medical attention, the tumour being practically always small and unilateral. It is not surprising, therefore, that in all such reported cases permanent cure has followed conservative unilateral removal of the adnexa.

When, as is much more common, such an oestrogen-producing tumour occurs during reproductive life, when the menstrual function has long since been established, and all the secondary sex characters long since developed, the effects are simply those which one would expect from a quantitative increase in the circulating oestrogen, much as would be noted after persistent administration of oestrogen. No secondary sex changes would be expected, and none occur. Menstruation may be increased or it may be normal in amount. Disturbances of menstrual rhythm may occur, and even long periods of amenorrhoea are not rare.

Finally, in postmenopausal women, there would again be no especial body changes. The postmenopausal breast is far less sensitive to oestrogen than is the immature

breast of the child, so that no breast changes are noted, nor of course any other general body alterations. However, the uterus, unlike the ovary, retains its sensitivity to hormonal influence after the menopause, so that even in a woman of 70 or 75 years the presence of a granulosal or thecal tumour produces a striking hypertrophic reaction of the normally small senile organ, the hypertrophy affecting both the mucosa and the muscularis, so that the organ may resemble that of a young The endometrium shows the woman. proliferative effect which would be expected from a persistent oestrogen stimulation. This often takes the form of the well-known Swiss-cheese hyperplasia, but in the occasional case the hyperplasia may assume an atypical adenomatous and highly proliferative form, which may be, and undoubtedly often has been, mistaken for adenocarcinoma, as discussed in the recent paper of Novak and Rutledge (1948).

Finally, an increasing number of cases is being reported in which ovarian tumours of granulosal or thecal variety have been associated with unquestioned adenocarcinoma of the endometrium. The relative incidence of this association is too high to avoid the belief that the oestrogen produced by the tumour plays at least a highly predisposing role in the development of the cancer. Aside from the presence of ovarian tumours, there is some evidence to indicate that postmenopausal oestrogen production predisposes to adenocarcinoma. The whole question of the role of oestrogens in the production of cancer is a fascinating and provocative one, but it is too extensive to embark on in this paper.

The special microscopic characteristics of granulosa tumours are the morphological resemblance of the constituent cells to normal granulosal epithelium, and the tendency of the cells to show the growth-pattern of normal granulosa. This is

manifested by the tendency of the cells to arrange themselves in small annular clusters or rosettes remindful of the primitive follicular pattern seen in the ovary, and the presence of clear cystic spaces produced by cystic liquefaction of some of the cells: the so-called Call-Exner bodies. There are, however, innumerable architectural patterns which may be assumed by the neoplastic granulosal cells, such as the diffuse, the folliculoid, the cylindromatous, the gyriform, the moiré silk, the pseudoadenomatous, the tubular, the von Kahlden or folliculoma malignant pattern, and still others. In all these, however, the fundagranulosal characteristics discernible, so that in most cases the microscopic diagnosis is not difficult (Figs. 12 and 13).

Thecoma, on the other hand, is made up of bundles of fusiform cells which are apt to be separated by bands of ordinary connective tissue, often hyalinized. The thecomatous cells are usually rich in lipoid. A helpful diagnostic point is that in most cases one sees areas of cells which are typically or approximately granulosal in appearance, emphasizing the fact that the descendants of the feminine mesenchyme may assume either granulosal or thecal characteristics, or that there may be a There are frequent mixture of both. instances in which the tumour is better spoken of as granuloso-thecoma rather than either granulosa-cell tumour or. By means of reticulum stains of one sort or another, it is possible to distinguish the granulosal and thecal cells with fair precision, but there is usually very little difficulty on this point merely from the morphology of the cells (Figs. 14 and 15).

Both granulosal and thecal-cell tumours may undergo interesting cell changes in the luteinization, partial or complete, which the granulosal or thecal cells, as the case may be, may undergo. Such a change is more often seen with the granulosal type of tumour (the folliculome lipidique of Lecene). In spite of this luteinization, and even when this is quite extensive, the biologic effects of such tumours are usually those referrable to oestrogen alone, so that the transformation of the granulosal into lutein cells appears to be a purely morphological one rather than actually functional (Fig. 16).

But there are exceptions to this, for in at least a small group of reported cases, including two of my own, both oestrogen and progesterone effects were noted. For example, in one of my cases a partially luteinized thecoma in a woman of 54, ten years beyond the menopause, was associated with a definite progestational endo-In some cases the lutein metrium. transformation of a granulosal tumour is complete, and it is to this type of lesion that the term luteoma is, in my opinion, best applied. In a case of this sort observed by Henriksen, who kindly sent me material for study, the endometrium exhibited typical decidual transformation.

The term luteoma has been a very controversial one, and certain masculinizing tumours have been reported under this designation. However, I believe that the lutein-like cells characterizing such tumours are really of adrenal character, or that they are derivatives of the totipotent mesenchyme, as I have previously discussed. It is difficult to believe that neoplasms could arise directly from such transitory and - short-lived elements as lutein cells, which, after all, are only modified granulosal or or thecal cells. In the present state of our knowledge it would seem best to limit the term luteoma to this feminizing group, and to avoid its use for masculinizing growths.

Other considerations. I have said nothing as to the possible value of hormonal determinations in the diagnosis of these tumours, because little of a definite nature can be said. Observations on this point have been meagre, especially in the case of the masculinizing tumours, and difficult to evaluate because of lack of standards in technique. A curious and unexplainable finding in a small number of dysgerminomas has been a positive biological pregnancy test, at least suggesting that the tumour may produce gonadotrophes.

Nor have I discussed the so-called gynandroblastomas, in which one and the same tumour shows a combination of typical granulosa-cell and arrhenoblastomatous elements. I have had the opportunity of studying 4 of these cases. Plate collected II from the literature, but an analysis of these would seem to eliminate a good many as faulty interpretations. In the majority of such cases the effect of the combined tumour has appeared to be masculinizing.

Finally, I have gone into little detail as to the incidence of recurrence and metastasis after the removal of tumours of this group. All of them must be looked upon as potentially malignant, though the degree of malignancy is certainly far less than with the ordinary types of primary ovarian° carcinoma. Only a few follow-up studies of the various forms have been made, usually of comparatively small groups. The most recent of these, dealing with dysgerminoma, is that of Santesson (1947), which conforms to my own conviction that pathologists are inclined to view these tumours, as well as others of this dysontogenetic group, somewhat too lightly. In 24 of 28 cases in which rupture of the capsule had occurred preoperatively, including some in which the operation was of radical type, recurrence occurred, with a fatal termination within 5 years. On the other hand, in 61 patients in whom the capsule was still intact, there was a 5-year survival in 49.

With granulosa-cell tumours, as with the

other two types which have been discussed, I believe that as more extensive follow-up studies become available the incidence of recurrences and metastases will be found to be much higher than the low figure now given by some authors, probably somewhere between 20 and 25 per cent. It must be remembered that recurrences may be late, as much as 18 years after the original operation. The same general comment may be made as to arrhenoblastoma, in which follow-up studies are even more scant than with the other two varieties.

### SUMMARY.

The present paper is based on the correlated pathological and clinical study of 43 cases of dysgerminoma, 51 of arrheno-blastoma, and 161 of granulosa-cell tumour and thecoma. The probable origin of dysgerminoma from cells dating back to the early undifferentiated stage of gonadal development explains why this tumour-type produces no endocrinal effects.

As regards masculinizing tumours, our ideas as to this histogenesis show an increasing departure from Meyer's simple concept of an origin from vestiges of masculine-directed cells persisting in the medullary portion of the ovary. This would still seem adequate in the explanation of arrhenoblastoma, a designation which includes all possible histological gradations of testicular structure-reproduction, always imperfect and often so highly abortive as to be almost unrecognizable. The theory does not, however, explain the masculinizing groups spoken of under such designations as virilizing lipoid tumour, adrenalcell tumour, masculinizing luteoma, and These seem better masculinovoblastoma. explainable by invoking the factor of the differentiating potency of the gonadal interfollicular mesenchyme, as has been discussed in the paper. It seems probable that

the histogenesis is a varied one, and that at least some members of this group are of definitely adrenal character, with a probable origin from adrenal-cell embryological inclusions in the ovarian area.

The increasing accent on the role of the mesenchymal differentiating potency has been exemplified also in the explanation of the histogenesis of granulosal- and thecalcell tumours. Meyer's theory of an origin from granulosal-cell rests seems inadequate, and we must go back to a progranulosal and prothecal mesenchymal phase for the explanation of the feminizing tumour. Such tumours may develop along either epithelial (granulosal) or connective tissue (thecal) lines, but they often show a mixture of both, justifying the designation of granuloso-thecoma. Perhaps a more inclusive designation for the whole group would be feminizing mesenchymoma. The not uncommon luteinization of these tumours is usually partial, but in the occasional case is complete, in which case the term luteoma has its clearest justification. In the present state of our knowledge it is unwise to apply this name to any of the masculinizing group of tumours.

Finally, the clinical characteristics of tumours of the above-mentioned groups have been discussed, with chief reference to their endocrine effects.

The appended bibliography includes not only papers referred to in the text, but also a selected list of others bearing on the general subject.

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## PRIMARY CARCINOMA OF THE VAGINA\*

BY

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PRIMARY cancer of the vagina is a rare disease—much more rare than secondary cancer—and on that account it must have an appeal at least to the curiosity, but more than that, a study of the literature of the subject reveals a state of almost universal despondency. In 1935 Frederick Joseph Taussig, who made so many advances in the treatment of gynaecological cancer, addressed these words to a Congress organized by the American College of Surgeons: "We acknowledge our total inability to do anything effective for primary cancer of the vagina."

I am convinced that the comparative rarity of this disease is responsible to some extent for the almost universally gloomy outlook, since few can get sufficient material and gain enough knowledge of the behaviour of the disease to become proficient in its treatment.

Since an increasing number of cases of vaginal cancer were being referred to me for treatment under the aegis of the recently-formed North of England Cancer Organization (there were 10 in 1947 which are not included in this paper), I determined to make a study of our own experiences in Newcastle and to analyze our failures and successes in order to see if I could get a clearer knowledge of the disease and its behaviour, and thus form a basis for future treatment. It is largely the results

of this analysis which I wish to communicate to you this afternoon.

It is now 122 years since Cruveilhier first described primary cancer of the vagina before the Anatomical Society of Paris in 1826, but it was certainly known, if not reported, before that time, for he stated in his paper that "the association of a cancerous vagina with a normal cervix and uterine body is not rare." How rare it is in relation to the population as a whole we cannot determine. We cannot even determine how frequently it is a cause of death, for the Registrar-General makes returns of carcinoma of the vulva and vagina under one heading, and one assumes that his returns are accurate. As to their accuracy you can judge for yourselves when I tell you that the office of the Registrar-General recently supplied me with the dates and cause of death of 136 patients who had suffered from carcinoma of the vulva, and 47 of these had been discharged from hospital with untreatable disease confirmed by biopsy, and all had died in a few months, yet in 32 of these cases the certified cause of death was not cancer of the vulva but a variety of conditions ranging from cancer of the uterus to senility and syphilis.

The best that can be done is to establish an incidence in relation to other forms of malignant disease and Table I shows this incidence during the last 16 years at Newcastle. This figure of 44 may be a slight underestimate as I have rejected, for the purpose of this paper, 10 cases in

<sup>&</sup>lt;sup>7</sup> The Tenth William Blair Bell Memorial Lecture delivered before the Royal College of Obstetricians and Gynaecologists on 23rd January, 1948.

TABLE I.

Total Cases of Malignant Disease of the Female
Genital Organs, 1930-1946.

			<b>u</b>	- 25			
Carcinoma			uteri		***	•••	1960
Carcinoma	of	ovary	•••	•••	***	•••	386
Carcinoma			, **:	•••	•••	•••	188
Carcinoma	10	corpus	uteri	•••	•••	•••	155
Carcinoma Carcinoma	ot	Vagina	inn to	, ho	•••	•••	44
Carcinoma	O1	ranopi	an c	ibe	•••	••••	
							2734
		_					-124

Ratio of carcinoma of vagina to carcinoma of cervix, 1 to 45.

Ratio of carcinoma of vagina to genital carcinoma, 1 to 62.

which, either from the paucity of the notes or on account of the advanced stage of the disease, it was not clear that they were actually primary vaginal cancers. Thirtysix came at some stage or other under my own observation. The cases under consideration were all quite clearly associated with a normal uterus and vulva, and can be regarded as genuine cases of primary vaginal carcinoma. Its frequency in relation to carcinoma of the cervix I have found to be 2.2 per cent, a figure which is closely comparable to Elizabeth Hurdon's estimate (1942) of 1.9 per cent at the Marie Curie Hospital.

TABLE II.

Age Incidence.

Age	No.	Age	No.
group	of cases	group	of cases
0-20	0	51-60	16
21-30	1	б <b>1</b> –70	7
31-40	4	71–80	4
41-50	12	Over 80	0

Average age, 54. Youngest, 24. Oldest, 73.

Age incidence (Table II). There is a considerable difference of opinion among various authors as to the commonest age at which this disease occurs. Elizabeth Hurdon asserts that it is a disease of advanced life, and that only 2 of her patients

were under 50. Emmert (1938) found an average age of 53; Moench (1931) an average age of 59; den Hoed (1936) had 10 cases under 50 and 17 between 50 and At the other extreme Novak (1940) believes the commonest age-group to be 35 to 55, and Ewing (1940) places the figure as low as 30 to 40. As will be seen from Table II the average age in my series is 54, with 40 per cent of the patients under the age of 51. It is clear therefore that there can be no justification for the attitude taken by some that the age incidence is so high and the expectation of life so short that the time spent in achieving a cure is not justified.

Parity and civil state (Table III). Nearly a quarter of these patients were nulliparous and, in this respect, carcinoma of the vagina

TABLE III.
Parity and Civil State.

Civil state:	Married and	wido	wed			39
	Single		• • •	• • •	•••	4
	Not stated	•••	•••	•••	•••	1
Parity:	Parous	•••				29
		•••	•••	••• ٢,		7
	Not stated	•••	•••	•••	.)	8 

seems more closely allied to carcinoma of the vulva than to cervical tumours. One of these tumours arose during pregnancy but, owing to delay in diagnosis, treatment was not instituted until 6 months after delivery.

Symptomatology (Table IV). As in carcinoma of the cervix, bleeding is also the

Table IV. Symptoms.

Vaginal bleedin		•••		•••	•••	24
Brown or red di	ischar	ge 🗅	• • • •	•••	•••	8
Pain and bleed	ing	•••		•••	•••	` 3
Post-coital blee	ding	•••		•••	•••	2
Postpartum ble	eding	• • •	•••	•••	•••	··· 1
Pain		•••			•••	*** *
No symptoms		•••		•••	•••	;
No information	t	•••	•••	***	•••	···. 4

predominant symptom in carcinoma of the vagina. Bleeding cannot take place until ulceration occurs and, since the vagina is a very thin structure in comparison with the cervix, it might be expected that this symptom would be noticed earlier in vaginal cancer. Of 38 cases in this series bleeding had been present for 3 months or less in 20. Early diagnosis ought to be possible but the very thinness of the vaginal wall, which might be expected to allow symptoms to develop early, also allows the growth to spread to neighbouring structures at a very early stage and some very advanced cases were encountered who had, had symptoms for only a few weeks. (Table V.)

Table V.

Duration of Symptoms.

		No. cases	No. of untreatable cases
No symptoms	•••	I	0
		2	I
1-3 months	•••	17	3
4-6 months		IO	- 2
7-9 months		3	2
10-12 months	•••	3	0
13-15 months	•••	ī	I
16-18 months		0	0
19-21 months		0	0
22-24 months	•••	I	0
No information		6	2

Pathology. Concerning the histological appearances of vaginal carcinoma there is no difference of opinion among writers on the subject. All are agreed that the vast majority of these tumours are squamouscelled carcinomas. The occasional appearance of primary adeno-carcinoma of the vagina gives rise to interesting speculation concerning its development. These tumours most probably arise from Müllerian rests, and in this connexion I would like to draw your attention to a rather uncommon disease first described by Bonney and Glendinning (1910) and termed by

them adenomatosis vaginae. They described a patient in whose vaginal wall were multiple mucus secreting glands which had coalesced and formed small cysts. This disease was more fully dealt with in 1940 by Plautt and Drayfuss, of New York, who described a further stage in which there was a cauliflower-like red mass clinically indistinguishable from carcinoma, and they believe that this condition is the forerunner of most cases of primary adenocarcinoma of the vagina. It certainly appears to have been in one of my cases. This tumour occupied the whole of the anterior vaginal wall and obstructed but did not invade the urethra. It was at first thought to be secondary to a corporeal or bowel tumour, but exhaustive investigations did not reveal the presence of any such primary. I transplanted the ureters and at that time was able to confirm the absence of an intestinal carcinoma. I followed this by excising the cervix, vagina, urethra and bladder base by the perineal route and the patient is in excellent health one year after operation.

One other case of primary adenocarcinoma occurred in this series. This tumour occupied the upper third of the posterior wall of the vagina and contained corpora amylacea such as are found in the prostate and was undoubtedly derived from a Wolffian remnant. The outcome of this case was not so happy, as I accidentally wounded the rectum in performing Wertheim's operation and the patient died of peritonitis.

It has been suggested that carcinomas of the vagina are generally more malignant than those of the cervix and Mary Moench found at the Mayo Clinic that 20 out of 35 cases were of Broder's Grade IV, that 12 were Grade III, 2 of Grade II, and only one of Grade I. Emmert, on the other hand, in 13 cases found 8 of Grade II and 5 of Grade III, and none in Grade IV.

Dr. Glucksmann, of Strangeways Laboratory, Cambridge, has classified 27 of the cases in my own series from which material has been available with the results shown in Table VI. In addition he has classified them into anaplastic squamous (and this term, as used here, signifies a tumour in which there is a low degree of differentiation in the growing edge but which on becoming old may show a high degree of keratinization, even with cell-nest formation) and anaplastic parkeratotic which are undifferentiated tumours. Judging from

TABLE VI.

Histological Classification.
(27 sections only available for study.)

Broder's Grade	No. of cases	
I	I	
2	6	
2-3	8	
3	11	
3-4	I	
4	0	

"Anaplastic squamous" 8
Anaplastic parkeratotic 17
Adenocarcinoma 2

work on carcinoma of the tongue and cervix a high proportion of tumours which respond unfavourably to radiotherapy are found in this latter group and it is also probable that this type of tumour is associated with early and often widespread involvement of the regional lymphatics. Any further sub-division of this small series of cases becomes mere speculation and is not profitable.

Pathological anatomy. The anatomy of the vagina and its lymphatics is an important matter in the approach to this problem but it is necessary to reduce it to simple terms.

The vagina must be regarded as a tube open at its lower end and closed by the cervix at its upper end. Lying behind it is the rectum and in front the urethra and bladder. At each side is a thick band of

connective tissue, the paravaginal tissue, merging with the suspensory ligaments of the cervix above and the levator ani muscles below.

The lymphatics of the vagina follow the relatively simple arrangement shown in Fig. 1. Those from the upper half drain to the inter-iliac nodes lying between the external and internal iliac arteries, and to the internal iliac nodes, and generally follow the course of the lymphatics of Those of the lower end the cervix. drain into the inguinal lymphatics, but some drain directly into the medial group of external iliac nodes. There is a free anastomosis between the lymphatics of the upper and lower half of the vagina and also between those of the right and left sides. In considering the lymphatic spread of vaginal tumours, the vagina can be divided Tumours of the upper third into thirds. metastasize in the same way as a cervical cancer, those in the lower third in the same way as a carcinoma of the vulva, whilst those occupying the middle third spread their metastases by both routes. A close understanding of this relatively simple arrangement is absolutely necessary as a basis of treatment.

Neighbouring structures. The proximity of the urinary apparatus and rectum proves an obstacle in treatment, although this is more apparent than real. Our minds tend to be fixed too much on the more common carcinoma of the cervix, so that when we meet a small carcinoma of the vagina involving the bladder we tend to think of it as being hopelessly advanced. Now this is not always the case. As I have pointed out before the vaginal wall is very thin and involvement of the urethra, bladder and rectum may occur at an early stage in the development of the growth, whereas, owing to the size of the cervix, fistula-forming in growths of the organ are almost invariably associated with wide-

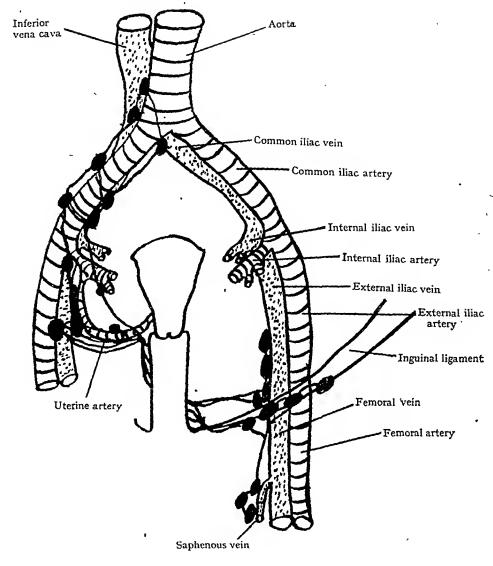


Fig. 1. Schematic representation of the lymphatic drainage of the vagina.

spread involvement of the broad ligaments and pelvic cellular tissues. One of the untreated cases in this series had a small ulcer the size of a sixpence at the lower end of the anterior vaginal wall which had perforated the urethra in 2 places. This patient did not die until 2 years after she had been rejected as too advanced for treatment, whereas the average survival after rejection was 10 months, or 9 months if this particular case is rejected from the series.

None of our cervical cases, rejected because of fistula formation, survived more than 4 months. Preliminary transplantation of the ureters will give greatly increased scope for either surgery or radiotherapy in such cases. Another patient in this series had a tumour on the posterior vaginal wall attached to the rectal mucous membrane. The tumour and the rectal mucosa were removed and the patient is now alive and well 9 years after operation.

Abnormal anatomy. There does appear to be an increased incidence of carcinoma of the vagina in women with prolapse, especially if they have worn pessaries. There were 3 such cases in this series and one in a woman with a huge procidentia (Plate I). In one case a carcinoma had developed in the left lateral fornix where this had been in contact with a large fibroid polypus.

Situation of the tumour. Table VII shows the situations in which the tumours were encountered in this series and gives

series 92 per cent of the posterior wall tumours occurred in married women, whereas in single women 47 per cent of the tumours were on the anterior wall, but in my series all the anterior wall tumours were encountered in married women. Once again it is the rarity of the disease and the small series that are responsible for such wide variations in the figures.

Treatment. For many years no real attempt was made to treat vaginal cancer, indeed, for long after its original description, no treatment was possible. The

TABLE VII. Situation.

			Upper third	Middle third	Lower third	Upper and middle thirds	Middle and lower thirds	All thirds	Total
Anterior wall	• • •		I	3	4	1	I	3	13
Anterior and right lateral	• • •		0	o	ò	0	r	ŏ	I
Anterior and left lateral	• • •		0	0	0	0	0	I	I
Posterior wall			4	I	2	I	0	I	9
Posterior and right lateral	•••	•••	Ì	0	0	3	0	0	I
Posterior, right and left lateral	• • •	<i>:</i>	0	0	0	I	O	2	3
Posterior, anterior and left	•••		1	0	0	0	0	ı.	2
Encircling vagina		•••	0	0	2	· 3	О	3	8
Right lateral	• • •	• • • •	I	1	I	ō	O	0 .	3
Left lateral	•••	•••	2	0	0	r	0	0	3
			IO	5	9	7	2	11	44

Anterior wall not involved, 19 cases. Posterior wall not involved, 21 cases

some idea of the problems facing one when an attempt is made to design a radium applicator for the treatment of vaginal carcinoma. The majority of these tumours are said to arise on the posterior wall. Emmert found 14 out of 37 in that situation; Rhode (1897) 71 out of 123 cases; den Hoed 12 out of 31; and Mary Moench 65 per cent on the posterior wall and 17.5 per cent on the anterior wall. In my series the posterior wall was involved in 23 cases, but where only one wall was attacked it was the anterior that was most frequently the site of the tumour. In the Mayo Clinic

dawn of antiseptics was not yet, abdominal surgery was an art of which few dreamed, and Pierre and Marie Curie were unborn. As late as 1886 we find Herman purposely creating a vesico-vaginal fistula to relieve retention in such a patient, and 10 years later C. H. Roberts was considered exceedingly bold in advocating attempts at extirpation of certain small vaginal cancers; for anything more advanced he advised cautery, scraping and the use of antiseptic tampons. In the same discussion Lewers (1896) stated that in his opinion operative treatment of all kinds was useless.

At Leicester in 1905 Ernst Wertheim introduced his radical operation for carcinoma of the cervix to this country, and after a while certain operators commenced to use it as a method of treating some vaginal cancers, and in 1923 we find three papers in the Journal of Obstetrics and Gynaecology, by Dougal, Holland and Stevens, describing cases treated in this Meanwhile radium was being more extensively used for both cervical and vaginal cancers and it is of some interest to note that the first suggestion for the use of radium in the treatment of internal cancer, as opposed to skin cancer, came not from a doctor, but from Alexander Graham Bell, the inventor of the telephone, who suggested it to a friend, Dr. Zowers (1903). However, neither method was meeting with much success, as Stevens remarked in 1923 that the tumours are difficult to treat surgically and the results have been very bad, whilst in 1931 de Buben, in Budapest, collected the published results of 120 cases treated by radium with a 5-year cure rate of 4 per cent. Hopes were temporarily raised by the treatment of cancer with lead, but as far as I can discover Blair Bell (1930) treated only one case of vaginal cancer solely in this manner and that was a secondary tumour. Professor Jeffcoate (1947), who has kindly searched the collected papers of Blair Bell in the possession of Liverpool University, informs me that Blair Bell favoured excision of the uterus, appendages and vagina from below and followed this by lead treatment. He seems, however, to have made no specific contribution to the literature on this subject. No one has ever published anything approaching a series of cases of carcinoma of the vagina treated by radical surgery, but there is no doubt that the operation is a much more difficult one than when performed for carcinoma of the cervix.

Naturally enough when considering radical surgery in genital cancer the name of Victor Bonney comes to mind. Mr. Bonney has been kind enough to send me a note on his experiences with this disease. Few of the patients that he saw were operable, mostly because of the tumours having involved neighbouring structures, due to the thinness of the vaginal wall. He further states that "most of the primaries that I have seen were high up in the vaginal wall and curiously enough in young women. . . . I remember one remarkable case in a girl of 19, but it was absolutely inoperable". He used Wertheim's operation on only a few occasions but there is unfortunately no record available of these particular cases.

With so many difficulties besetting surgical treatment and with gradually improving results in the treatment of cervical carcinoma with radium it is easy to see how radiotherapy came to take pride of place in the treatment of carcinoma of of the vagina, but the results in general fall short of expectation, and here once again we find the infrequency of the disease embarrassing the radiotherapist just as it does the surgeon. Emmert of St. Louis recorded an absolute 5-year cure-rate of 12 per cent; den Hoed from Amsterdam. a relative 3-year figure of 30 per cent. The Mayo Clinic figure is 17 per cent absolute, while 12 per cent is the result for the treatment of 99 cases at the Memorial Hospital. New York. Berven and Heyman (1939), from Stockholm, reported seven 5-year cures out of 53 cases, and the only encouraging results are those of Courtial (1939) at the Paris Radium Institute, who recorded ten 5-year survivors out of 22 cases treated between 1919 and 1933. Lederman and Meyneord (1942) were able to find only 7 cases at the Radium Department of the Royal Cancer Hospital between 1929 and 1940. Most of them were advanced and

there was one 5-year survivor. It is not easy or profitable to draw conclusions from the relatively small series reported in the literature, but when I came to make a detailed analysis of the results of treatment in our own cases at Newcastle I found many points of interest which explain some of our past failures, and I will now discuss in detail the results of the 44 cases which have been seen between the years 1930 and 1946.

Methods of treatment and results. Eleven patients were considered too advanced for treatment and of the remaining 33, 6 were treated surgically and 27 by radium.

Untreated cases. The average duration of life in these cases was 15 months from the onset of symptoms and 10 months from the time that they were rejected as unsuitable for treatment. Table VIII shows a summary

over our difficulty with these important neighbouring structures.

Surgery (Table IX). There were 6 cases treated purely by surgery. Three were not particularly extensive operations and 3 were very radical. Let us consider first the less radical operations. One consisted of an excision of the lower half of the vagina with dissection of the superficial groinnodes and the patient died 6 months later with a local recurrence and secondaries in the mediastinum. One is surviving 14 years after a local excision of the tumour and another 9 years. Of the 3 radical operations, I have already mentioned 2 as they were performed for the 2 adenocarcinomas that occurred in the series. The third was a squamous-cell tumour, not very extensive, but involving the base of the bladder. I transplanted the ureters and

TABLE VIII.

Summary of Untreated Cases.

Case No.	Age	Duration of symptoms	Reason for rejection	Survival after rejection
2	50	3 months	Urethra destroyed	12 months
3	65	6 months	Urethra involved	24 months
š	53	2 months	Extensive disease	8 months
ŏ	73	1 month	Cardiac disease	3 months*
11	48	Not stated	Tumour fixed to bone	e 7 months
13	71	15 months	Advanced age	6 months
15	60	Not stated	Extensive disease	6 months
24	54	2 months	Urethra destroyed, tumour fixed to bone	6 months
27	49	4 months	Bladder involved	6 months
28	59	7 months	Extensive disease	ro months
30	59	9 months	Paravaginal tissue fixed to pelvic wall	15 months

<sup>\*</sup> Death from coronary thrombosis.

of these patients and the reasons why they were not treated. Some of them survived so long that they were almost certainly treatable, and I think that we have rejected a number of them without justification, and particularly where small tumours involved the bladder. We have rejected these because of a lack of vision concerning the possibility of employing surgery to help us

then performed a radical hysterovaginectomy with total cystectomy by a combined abdominoperineal approach. The pelvic nodes which were removed showed no evidence of growth. This patient was an extremely difficult individual, who was pugnaciously antagonistic to the nursing staff. She developed a bed-sore over her sacrum, upon which she insisted on lying.

TABLE IX.

Cases Treated by Surgery.

Case No.	Site of tumour	Nature of operation	Survival	Condition on death
4	Lower third 4 walls	Excision and super- ficial groin dissection	6 months	Local recurrence and wide- spread metastases.
7	Lower third 1 wall	Local excision	14 years	(Still alive and well.)
20	All thirds 1 wall	Local excision	9 years	(Still alive and well.)
26	Middle third 1 wall	Ureteric transplant Wertheim's hysterec- tomy and total cystectomy	6 months	Osteitis of the sacrum. No recurrence.
29 .	Upper third wall	Wertheim's hysterectomy	o months	Peritonitis. Post-operative death.
43	Middle and lower thirds I wall	Ureteric transplant Vaginectomy and urethrectomy	I year	(Still alive and well.)

When I made her walk about all day she discharged herself from hospital, and at home, despite the protests of her doctors and relatives, she lay on her back and refused to get out of bed. She died of osteitis of the sacrum 6 months after operation with no evidence at autopsy of recurrence or metastases.

Radium. Twenty-seven cases were treated with radium. There was I postoperative death; I patient died of intercurrent disease and 16 of cancer before 5 years had elapsed. Of the remaining 9, I is alive and well after I year, and 7 are surviving 2, 3, 4, 8, 9, 10 and 13 years respectively, whilst another died of intercurrent disease II years after treatment. The gross results of cases treated more than 5 years ago are seen in Table X. It will be noted that the 10-year figures are slightly better than the 5-year results. This is due to chance playing a hand in a very small series of cases. As it happens, in the 10-year figures there are quite a number of cases that have done well with radium throughout the series, namely tumours of the upper vaginal third. In the subsequent group there were not so many of these, and this explains the freak result. If we exclude tumours of the upper third of the vagina it is not an easy matter to apply radium to those occurring elsewhere, and also to ensure that it stays in the proper position during treatment. When one considers the diversity of situations in which a growth may be found, and the rarity with which the disease appears, it is not surprising that the odd case which is seen from time to time is made to conform to one of the often-used methods, such as one of the cervical techniques, sometimes

Table X.

Results of Radum Treatment.
(Various techniques)

Total cases	Total cases		ıl cases
seen	treated	alive	dead
	10-year	cases.	
14	7	3	4
	5-year ca	ses."	
<sup>2</sup> 5	14	5	9

<sup>\*</sup> Includes 10-year cases.

with little or no modification. Lederman and Mayneord hinted at this when they said "because of the relative rarity of the disease it is doubtful if any one radiotherapeutic centre has had sufficient experi-

but it has left unsolved the problem of dealing with the neighbouring parts of the vagina and paravaginal tissue.

For many years we employed the Stockholm technique in dealing with cases of

TABLE XI.
Interstitial Radium.

Case No.	Site of tumour	Survival	Condition at death	Duration of symptoms
8	Middle third 1 wall	7 months	Local tumour present	3 weeks
9	All thirds 3 walls	3 months	Local tumour present	Not stated
12	Upper third	11 months	Pelvic gland metastases	Not stated
·34	Lower third 1 wall*	25 months	Metastases in liver	ı year
38	Lower third 4 walls	12 months	No growth. Died of other causes	None
40	Middle and lower thirds 1' wall	S months	Fungating groin glands	6 months
41	Middle and lower thirds r wall	o months	Postoperative death Pulmonary embolus	6 weeks

<sup>&#</sup>x27;Groin dissection in addition to radium.

ence to develop and perfect a reliable technique," and they further added "that in cancer of the upper third the ordinary cervical technique is reliable but it is not an easy matter to apply radium to a tumour in the lower two-thirds of the vagina."

In our attempts to get accurate irradiation of the tumour we used interstitial radium on 7 occasions and there was one postoperative death (Table XII). One patient died one year after treatment from other causes and none of the others survived longer than 2 years. This method can only be compared to a local excision and therefore cannot be expected to give more than an occasional success. I cannot believe that there is anything to commend it as a routine measure. It has solved one problem only, namely the local irradiation of certain awkwardly-placed tumours,

cervical cancer and more recently the Manchester technique, and it was natural that we should employ some modification of these methods in the occasional vaginal carcinoma which we encountered. You will see from Table XII that the results

#### TABLE XII.

Total cases treated, 6  Died at 2 years  Died in less than 1 year  Alive and well after 4 years  Stockholm Cervical Technique.  Total cases treated, 12
Died in less than 1 year
Alive and well after 4 years
Alive and well after 4 years
Alive and well after 2 years
Total cases treated, 12
Alive and well more than to years "
Alive and well I wear
Alive and well more than 5 years
Died other course after to wears "
Died in 1 year



PLATE I.

Procidentia associated with vaginal Carcinoma.



, š

PLATE II. Radiograph showing radium imbedded in stent in correct position.

PLATE III
Radiograph showing radium imbedded in stent in incorrect position.



PLATE IV.

Radiograph showing arrangements of "ovoids" to treat carcinoma of the vagina.

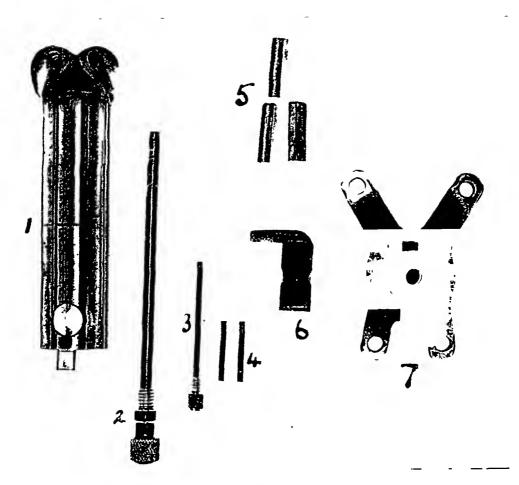
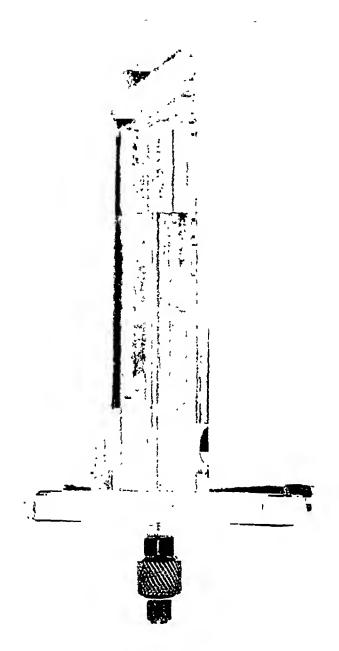


PLATE V.

### Key to Plate:

- 1. The vaginal tube with ovoids attached at the upper end.
- 2. The central radium container.
- 3. Pin for closing central radium container.
- 4. Brass blanks for central radium container.
- 5. Three segments of lead screen.6. Clamping pin for stabilization of harness attachment.
- 7. Harness attachment.



 $\begin{array}{c} \text{PLATE VI.} \\ \text{The assembled applicator.} \end{array}$ 



PLATE VII.
Radiograph of vaginal applicator in situ,

from the Stockholm technique in which all the earlier cases figure are a curious mixture of dismal failure and brilliant success. The Manchester technique has been used only in the last 5 years but looks as though it may well follow along the same lines.

If you turn to Fig. 2 you will see superimposed on a diagram of the uterus and middle and lower thirds of the vagina will receive so little irradiation that they cannot be cured unless extra radium sources are added.

Table XIII shows our results in II cases in which, either on account of the tumour being situated in the upper vaginal third, or because we added an additional radium source, adequate irradiation was given by

TABLE XIII.

Results of Radium Treated Cases where the Growth was Adequately Irradiated.

Site of tumour	Survival	Condition at death	Technique
Upper third	11 years	Died other causes	Stockholm
Upper third - wall	13 years	(Still alive and well)	,,
Upper third • I wall	10 years	(Still alive and well)	,,
Upper third I wall	9 years	(Still alive and well)	**
Upper third 2 walls	ı year	Local recurrence, pelvic g and liver metastases	land ,,
Upper and middle thirds 1 wall*	8 years	(Still alive and well)	**
Upper third r wall	ı year	(Still alive and well)	**
Upper third 3 walls	4 years	(Still alive and well)	Manchester
Middle third I wall*	4 years	(Still alive and well)	•
Upper third 1 wall	2 years	Pelvic gland metastases	,,
All thirds 4 walls*	2 years	(Still alive and well)	,,

Additional radium added to cover whole tumour.

vagina an area of effective irradiation resulting from the arrangement of radium designed to treat a cervical cancer. By an area of effective irradiation I mean an area in which we believe that it is possible to deliver a dose lethal to cancer from the arrangement shown. It at once becomes apparent that tumours situated in the

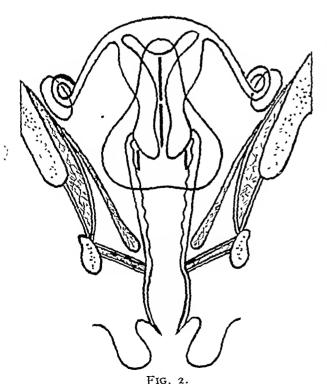
an intracavitary method. Six of these II patients are living or have lived more than 4 years. Table XIV, on the other hand, gives the results of 7 cases treated by an unmodified cervical technique in which the tumours did not wholly lie in the upper third of the vagina. The very fact that I have used the words months instead of

Table XIV.

Results of Radium Treated Cases where the Growth was Inadequately Irradiated.

Site of tumour	Survival	Condition at death	Technique
Lower third r wall	11 months	Local recurrence and groin glands	Stockholm
Upper and middle thirds 2 walls	11 months	Local recurrence, pelvic and groin glands	**
Upper and middle thirds r wall	5 months	Local recurrence	11
All thirds 1 wall	22 months	Local recurrence	**
Upper and middle thirds 3 walls	10 months	Local recurrence and metastases in spine	**
All thirds 3 walls	9 months	Pelvic gland metastases	Manchester
All thirds 3 walls	6 months	Local recurrence	,,

years in the survival column, as in the previous table, will tell you what has happened to them. The first case in the table was treated 16 years ago, and what radium in the vault was expected to do to

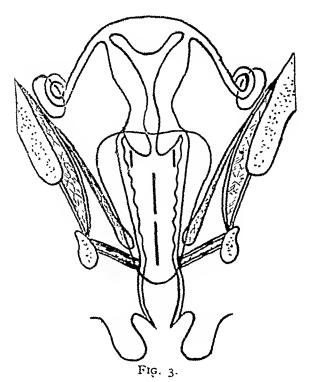


a tumour in the lower third, I cannot imagine. In cases 2, 3 and 5 it was hoped that sufficient irridation might reach the middle third, and the others were rather in the nature of palliation.

A moment ago we considered an arrangement of radium which was adequate for tumours of the cervix. In Fig. 3 I have tipped that curve upside down and by putting the radium source into the vagina instead of the cervix we have an arrangement which is suitable for the intracavitary method of irradiating vaginal tumours. It is, of course, very simple to draw this, but how can this idea be put into action? Several methods have been proposed somewhat on these lines. Clifford White, in 1937, published a method, which he has used. This consists of making a mould of dental stent and putting the radium, usually in the form of tubes, into the periphery so that it lies over the tumour. It certainly holds the radium in position but is liable to certain errors unless closely checked by Plate II shows a radioradiography. graph of a patient whom I treated last year by means of a combined ovoid and stent,

and in that plate you see the radium in the correct position for treating this particular tumour. Plate III shows the first result that I achieved. The distorted arrangement was due to the fact that the stent altered shape when the radium was introduced. In order to fit it into the vagina again it had to be warmed slightly and the pressure of the fingers at its re-introduction was sufficient to produce this effect. The variations of the isodose-curves in these two arrangements are very great.

In 1942 Lederman and Mayneord described an applicator which they developed at the Royal Cancer Hospital with a view to getting accurate apposition of the radium in treating tumours of the lower two-thirds of the vagina. This consists of 2 lead sheets, with a wax centre into which the radium needles are inserted. We ourselves had, as I previously mentioned, tried to solve the problem by placing "ovoids" down the vagina, as the X-ray photograph in Plate IV shows, but I do not consider



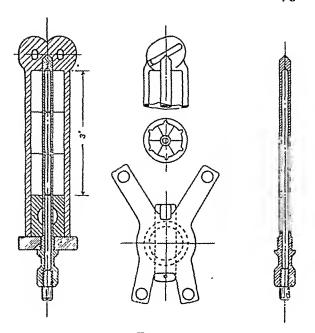


Fig. 4. Line drawing of the vaginal applicator.

any of these methods free from criticism, largely on the score that accurate apposition of radium is not a certainty and, in the case of the Cancer Hospital applicator, that it is cumbersome, because each case has to have a new applicator designed for it.

What we require is an applicator which will fit as large a number of cases as possible, conform to the arrangement which I have previously suggested, and ensure accurate apposition of radium during the time of treatment.

During the last 12 months my colleagues John Thurgar and Frank Farmer, and I, have devised an applicator which we believe will go far to solve the practical difficulties encountered in obtaining the desired arrangement. Fig. 4 shows a line drawing of this applicator.

The applicator.\* The applicator consists of a hollow vaginal tube to the upper end of which are attached 2 oval-shaped radium

<sup>\*</sup> Physical and constructional data will be published elsewhere at a later date.

containers, similar in design to the "ovoids" used in the Manchester cervical technique. These are arranged to irradiate the parametria and the upper part of the paravaginal tissue. The hollow vaginal portion of the applicator carries, centrally, a metal stem into which can be placed 1, 2, or 3 radium sources according to the site and extent of the tumour.

Screenage is effected by inserting a heavy metal (gold or lead) around the stem, 6 segments forming the complete circle. The object of the screen is to enable high intensity irradiation to be given to the tumour and at the same time to protect the noninvolved surrounding tissue. The number of segments of screen inserted will therefore vary in each case, and will depend upon the site and extent of the tumour. The screens are also divided longitudinally into thirds so that it is possible to have every combination from total screenage except for one sixth of the circumference of any given third of the vagina, to no screenage at all.

At the lower end the vaginal tube is closed by a solid cylinder carrying 4 projections (2 anterior and 2 posterior) to which the supporting harness is attached. The straps of the harness are adjustable and fit on to a belt around the patient's waist.

The whole apparatus, with the exception of the metal screens and central radium container, is constructed of a transparent acrylic resin and a material known commercially as "Stellon" has been found most suitable for the purpose. This material allows sterilization by boiling, is light in weight, and its transparency enables inspection of the tumour through its walls, and thus it is possible to plan the arrangement of radium and screens in direct relation to the size and position of the tumour.

The oval-shaped containers, which constitute the head of the apparatus, each carry 18.75 mg. of radium and the con-

tainer in the stem can accommodate, as a maximum, 3 tubes of 25 mg. each. Here again wide variations of arrangement are possible. Thus in a tumour in the lower third, two 25 mg. sources, one in the middle third and one in the lower third, can be inserted and the upper tube and radium source in the head of the applicator omitted. Similarly in a tumour situated in the upper third, the 25 mg. source in the lower third is not inserted. When it is not desired to insert a lead or gold screen a Stellon blank is inserted in its place and thus the position of every screen is accurately stabilized.

The tumour is inspected with the empty applicator in situ, and the arrangement of radium and screens is decided. applicator is removed and the appropriate screens inserted, and if radium is to be used in the head of the applicator it is placed in position at this time. The applicator is now re-introduced and the harness attachment fitted to the lower end and locked by a clamping pin which prevents rotation during treatment. The vaginal radium sources in the central tube are assembled by a technician and where a 25 mg. tube is not required a brass blank is inserted in its place. This tube is now brought to the theatre loaded, and is inserted and fastened by a screw thread, and in this way all unnecessary exposure of the operator to comparative large amounts of radium is avoided (Plates V and VI).

Plate VII shows a radiograph of our of our applicator in situ. This particular tumour-was a rather extensive one lying in 3 walls of the vagina in a somewhat corkscrew fashion, thus accounting for the bizarre arrangement of the screens. As it extended the whole length of the vagina 3 sources were employed in the central tube and radium in the head of the instrument can be clearly seen.

We propose in future to use this instru-

ment in such cases of carcinoma of the vagina as we encounter. We hope also that it may prove useful in treating cases of carcinoma of the cervix which have extended a long way down the vagina and we intend to employ it in the pre-operative irradiation of carcinoma of the corpus, since the presence of isolated nodules low in the vagina is not uncommon in this disease. Whilst we were designing this applicator Focht, Marinelli and Twomby (1947) of the Memorial Hospital, New York, published an account of an applicator of somewhat similar design. Their apparatus consists of a perspex cylinder into which fits a lead core with eccentrically placed radium tubes. We believe that the irradiation of the parametria by the introduction of radium into the fornices is an improvement on their design, and that the centrally-placed radium source in our applicator is a superior physical arrangement.

### CONCLUSIONS.

It would appear from this study that we have tended to reject some cases which, had a little more thought been exercised, would have proved amenable to treatment. Secondly, as far as radiotherapeutic methods are concerned we have not always been careful to irradiate the tumour adequately, and indeed we did not posses an instrument which would allow us to do so with any degree of accuracy; and thirdly, we have seriously neglected the lymphatic drainage of the vagina. There is one other factor which I must mention and that is that we have undoubtedly irradiated a certain number of tumours which were not likely to respond favourably to radium. In the last few years Glucksmann and Spear (1945) have developed a method of determining the response of an individual tumour to irradiation. Briefly, their method consists of estimating the percentage of viable and non-viable cells in a given area of growing tumour edge before irradiation and comparing it with further sections taken during treatment. If there is a great reduction in the percentage of viable cells the prognosis, provided the irradiation is adequate, is considered favourable, but where no such reduction takes place an early reawakening of tumour activity may be expected. This method has been used extensively in cases of carcinoma of the cervix with a high degree of accuracy. It is equally applicable to cases of carcinoma of the vagina, and I now employ it as a routine. Part of the dose of radium can be given as a test without vitiating later surgery if the tumour proves unresponsive.

Provided the tumour is likely to respond to the effects of irradiation, I believe that radium is the method of choice in dealing with vaginal cancer and that if accurate apposition of the radium sources can be achieved many cases which have previously proved fatal may be saved.

Radical surgery as the main line of attack on vaginal cancer in general will never, I think, be the method of choice for most The radical operation for carcinoma of the vagina is a formidable undertaking, much more serious than Wertheim's operation for cancer of the cervix, of which it is an extension; but I should not like to think that it will altogether disappear from the gynaecological armoury, because there are undoubtedly some tumours which, although limited, will not respond favourably to radium, and in these cases I believe that radical surgery will play a small but very important part.

As an ancillary to radium, surgery is most valuable. When the groin nodes are likely to be involved the radical block dissection is vastly superior to X-ray therapy, and in the case of the iliac nodes I believe that the iliac adenectomy operation of

Taussig may also prove superior to present methods of deep X-ray therapy. As a means of diverting the urinary or faecal flow surgery has not been employed sufficiently. If we can cure a carcinoma of the vagina only at the expense of stenosing the rectum, then surely colostomy is as justifiable as if we were dealing with a rectal cancer.

In my opinion the stumbling block to progress in the treatment of this disease is not so much a lack of ideas or of methods as our almost complete ignorance of the clinical behaviour of this rare form of cancer. We can, I feel certain, despite this rarity overcome the difficulty, and I should like to see a registry of vaginal tumours set up at which clinical details and pathological findings could be pooled and analyzed for all cases occurring in this country, in the same way as registries for osseous tumours and lymph nodes have been set up at the Royal College of Surgeons, and at Oxford. This college could play a leading role in such a scheme, especially if its Fellows and Members will contribute their information, no matter how small; and if our friends, the radiotherapists, possibly through the offices of the British Institute of Radiology and the Faculty of Radiologists, joined with us in such a scheme I am certain that it would cover almost every case of carcinoma of the vagina occurring in the British Isles. Perhaps if such a registry had been in existence I could have given you, for example, the results of the radium treatment of 270 cases instead of 27.

Some years ago, at a discussion on cancer of the vulva at the Royal Society of Medicine, F. J. Browne (1939) made a plea for the concentration of the treatment of that disease, on account of its comparative rarity, in the hands of a few interested people and by this means he suggested that some at least would gain a wide experience in its treatment. In Newcastle my col-

leagues have very generously adopted that view and handed me their cases of vulval cancer to treat. The improvement I have effected in my own technique is great and the results are better in consequence. How much more necessary such a concentration of vaginal cancer is, I hope I have made clear to-day.

Clinical material is the basis of clinical research, and in cancer, clinical research at the present moment, if not dead, is very moribund. The focus on cancer research has shifted from the ward and operating theatre to the laboratory, and those of us who are clinicians must take our share of the blame for this. It is up to us to play our part and make our contribution, for, make no mistake, the laboratory worker is as dependent on us as we are on him; the final test is on the man and not on the mouse. By a reawakening of clinical cancer research in gynaecology we shall follow an example set for us by the man to whom our College owes so much, William Blair Bell

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# AETIOLOGY OF ECLAMPSIA

BY

J. C. Beker, M.D. Arnhem, Holland.

THE term "toxaemia of pregnancy" was introduced at the end of the 18th century. The hypothetical toxin has been sought in the foetus, in the placenta and in the mother. but the search has been fruitless and no peculiar toxin has been found. Though many effects of morbid metabolism have been found in cases of toxaemia, not one of these has been found to be present in all cases. The only signs which are present in different degrees in nearly all cases are oedema, hypertension and renal damage shown in albuminuria or more gross urinary. changes. For 25 years I (1922) have doubted whether these clinical phenomena are caused by a toxin. It seems to me quite possible that all the typical phenomena can be explained by changes in the circulatory system during pregnancy. In a recent publication G. Smith and O. Smith (1947) reported a high level of gonadotrophic hormone to be characteristic of patients with toxaemia, even before the appearance of clinical symptoms. They conclude however, that the primary cause probably lies in a deficiency in the uterine circulation.

After reviewing some general problems in the physiology of circulation I shall discuss first the changes brought about by normal pregnancy and then the changes in what has so far been called toxaemia of pregnancy.

Before discussing the influence of pregnancy on the blood-supply of the uterus and its surroundings, I want first to consider what we know about the distribution of the blood in normal circulation and in this I follow chiefly Hess (1930) and Lovatt Evans (1945).

The total volume of blood is not sufficient to provide all organs with a maximum supply of blood at the same time. The continual fluctuations in activity of various organs call for continual changes in their blood-supply.

The normal circulation of the blood is able to anticipate these changes and regulate them on behalf of those organs which require more blood in periods of increased activity. The ultimate purpose of the circulation is the distribution of blood to the various capillary areas in actively functioning tissues. The reflex coming from an organ to regulate the entry of blood necessary for the time being to feed its tissues is called by Hess the nutrition-reflex. The volume of blood flowing through the various organs shows wide variations, depending chiefly on the intensity of metabolism in the organ and so on its oxygen requirement. During increased activity blood has to be transferred from temporarily inactive organs to active ones. This is regulated chiefly by the central nervous system, but the smaller variations in blood requirement can be regulated reflexly and this reflex grows stronger as the activity of the organ increases. The increased bloodsupply is brought about by dilatation of the arteries and arterioles and the afflux in larger capillary areas. Not only does the change in the flow of blood influence the arterial area concerned, but the interplay of collateral and neighbouring areas can

Influence of the muscle on the arteria! blood-flow.

Fig. 2. Sections through the placental site.

The influence of tonicity and of contraction of the muscle must be very important. Fig. 1. Uterus showing the arterial blood-supply to placental site.

J.C.B.

Difference in the blood-supply of the uterus between nullipara and multipara without pregnancy and in the first months of pregnancy.

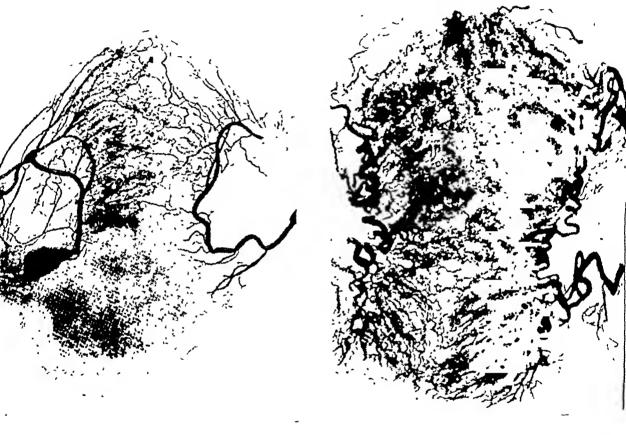


Fig. 4.
Arterial blood-supply in human uterus Nulhpara (Horn, 1918).

Fig. 5.

Arterial blood-supply in human uterus Multipara (Horn),



Fig. 6.

Arterial blood-supply in the uterus of the cow Nullipara.



Fig. 7.

Arterial blood-supply in the uterus of the cow.

Multipara.



Fig. 8
Afternal blood-supply Cow, nullipara, 2 months pregnancy



Fig. 9.

Arterial blood-supply—Cow, multipara, 2 months pregnancy.

Difference between the uterus of multipara and primipara with eclampsia. Arteries and muscle in the uterus of multipara are larger and thicker.

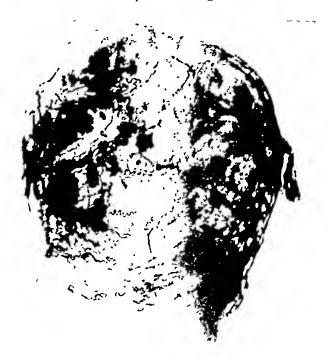


Fig. 10. Uterus of multipara.



Fig. 11. Uterus of primipara with eclampsia.

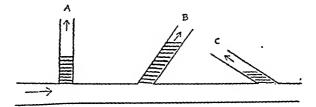
also help to regulate the augmented flow. The increase in the quantity of circulating blood can be supplied by the blood reserve in the spleen, liver and other areas, such as the splanchnic area. If this is not sufficient, blood has to be withheld from other organic areas by means of vasoconstriction of the arteries in these areas. The heart need not necessarily be overburdened if the demands made on it are not too high.

According to Hess the strongest reaction is brought about by the organs that are most important for life. Of first importance is the area of the coronary artery, then the brain and the lungs, which all continually demand a large supply of blood; then come the areas for which requirements are elastic, the muscular area as an ever-ready apparatus for movement, the skin with its heatregulating function, the renal and hepatic areas and lastly the splanchnic area with the weakest reaction and this only during digestion. There will also be a constriction of the venous vessels to increase the supply of blood to the heart and enlarge the minute /volume output of the heart. The extent of the area and the intensity of the reflex influence the extent to which the relief areas are involved in the reaction.

The direction in which an artery leaves the main artery is also of importance for a sufficient flow of blood through an organ. If the branch inclines at an acute angle to the direction of the flow the end-on pressure in the branch is greater than if the branch were at right angles, in which case the hydrostatic pressure in the branch would be equal to the lateral pressure on the wall of the main vessel (see diagram).

This is of importance in the supply of the kidneys, where the branches are at right angles to the aorta. It is also of importance in the case of the uterns, as the uterine artery enters near the cervix and after that the main branches bend immediately upwards.

almost at right angles, although the anastomosis with the ovarian artery makes the circulation easier. A second point which I want to make is the effect on the circulation



- A. Situation in the renal artery. The branch is at right-angles, hence the hydrostatic pressure in the branch is equal to the lateral pressure on the walls of the main vessel.
- B. Situation in the hypogastric artery. The branch is at an acute angle to the direction of the flow. The pressure will be greater than the lateral pressure in the main stem.
- C. The branch of the uterine artery is at an obtuse angle and the pressure will be less than the lateral pressure in the main stem.

when the resistance increases in an organ that is supplied with blood through a sidebranch. Here we shall also find a dilatation of the arteries. In this case a sufficient flow of blood can be supplied only by increased pressure in the main artery with the assistance of the general circulation, brought about by an increase of the output of the heart; but the most important point is the vasoconstriction in the peripheral arterioles. The experiments of Goldblatt, and his colleagues (1931, 1934, 1937, 1938, 1940), Wilson and Byrom (1939) are very important for an understanding of the actiology of hypertension. When a clamp is applied to one of the renal arteries a rise of bloodpressure results, not persistent or affecting the function of the kidney. Slight constriction of both arteries gave rise to mild hypertension. Wilson and Byrom, who carried out their experiments on the rat, found moderate constriction to be followed by hypertension and severe constriction by hypertension with convulsions and marked changes in the blood-vessels. This constriction affects a branch which leaves the aorta at a right angle. The only possible means of compensation to increase the pressure in the renal artery is vasoconstriction in the periphery, increased blood-pressure and increased minute/volume output of the heart. The nutrition-reflex in the kidney is of a chemical nature, a polypeptide, hypertensin, which acts as a pressor substance and causes continual hypertension. On the other hand an increase of blood-pressure from other causes will also cause vasoconstriction of the arteries in the kidneys so as to prevent an overflow. This, too, has been proved by placing the kidney in Shäefer's plethysmograph, whereupon after irritation of the peripheral end of the anterior root of the 10th dorsal nerve an increase in blood-pressure was observed, together with a diminution of the volume of the kidney and active contraction of the arterioles of the kidneys. The general circulation reacts with a rise in bloodpressure if a sufficient number of arterioles are constricted, but not if the vessels are entirely closed. A rise in blood-pressure is found in most people after repeated determinations at short intervals.

Let us now consider the reactions which pregnancy can bring about. During pregnancy alterations in the circulation of the blood will occur under physiological conditions. The uterus and its contents demand an increased supply of blood which must flow in constantly, otherwise the foetus will not be sufficiently supplied with oxygen. Soon after impregnation the uterus becomes larger and softer and hyperaemia points to an increased flow of blood. This nutritionreflex can hardly be other than hormonal, very likely from the trophoblast. More blood is carried to the uterus and this is made possible by hypertrophic changes in the blood-vessels, the calibre of the arteries being doubled. There is dilatation of the blood-vessels, not only in the uterus but also

in its surroundings. It is physiological that the walls of the capillaries become permeable. A larger quantity of blood is available, for an increase of 15 per cent in the total volume of blood has been established. During the first half of pregnancy the growth and hypertrophy of the uterine muscle are more rapid than the growth of the uterine contents. In the first months the uterine wall hypertrophies without any increase of uterine pressure. In the fourth month the thickness is one inch. The muscle is atonic and responds only slightly or not at all to pituitrin. There is no increase in resistance to circulation of the uterus during the first months of pregnancy. A strong nutritionreflex is brought about by the growing foetus and placenta, but the inflow of blood is not yet complicated by resistance in the area to which the blood is to be supplied. The venous blood flow is sufficient and free. There is a general increase of fluid in the tissues surrounding the uterus. This slight oedema accompanies the physiological changes of pregnancy and is necessary later on for making birth easier. It is therefore a physiological phenomenon.

In order to fulfil the demands of the nutrition-reflex of the uterus compensatory reactions take place in the general circulation. This can be considered probable, as the reflex acts in an area in the middle of the body, an area of blood-vessels which has to be continually supplied with more than sufficient blood so as not to endanger the life of the foetus. In order to provide enough blood in this central area of bloodvessels the minute/volume output of the heart of the pregnant women increases to one-third more than that of the nonpregnant woman (Frey, 1923). Observations on the nail-bed carried out with the capillary microscope showed that in normal pregnant women stases in the capillary flow occur approximately four times as frequently as in non-pregnant women (Hinselmann, 1924). Barcroft and Stevens (1928) made it clear that the blood from the reserve depots flows into the circulation, for they found the spleen to be contracted during pregnancy. In addition to the increased blood flow through the capillaries there is an increase of the venous pressure not only in the lower part of the body but also in the upper part (Runge 1924).

Increased demands are made on the circulation of the blood in the last months of pregnancy. In the second half of pregnancy the contents grow more rapidly and the wall becomes relatively thinner until at the end of pregnancy the wall is one-fifth to two-fifths of an inch thick. It is evident that the intrauterine pressure is slightly increased. In the first months the muscle is weak and atonic and contractions are few, in the later months the tonicity of the muscle increases, the contractions become more frequent and powerful and the response to pituitrin is more marked. The flow of blood through the uterus is very closely connected with the tonicity of the muscle. In order to gauge the tonicity of the muscle I determined its creatinecontent (Beker, 1922, 1926, 1929, 1931, 1934, 1942). For the purpose I examined the uterus bicornis of a pregnant cow, in which the percentage of creatine appeared to increase regularly during pregnancy. At the end of pregnancy it was doubled, in the non-pregnant horn it had increased, but to a much less extent than in the pregnant one. Tonicity of the uterine muscle increases therefore during pregnancy and is dependent on the growing contents. The tunica media of the veins is very closely connected to the muscle and the flow of blood therefore is dependent on the tonicity of the muscle.

The uterine artery, which anastomoses freely with the ovarian artery, distributes blood through about 8 branches, which lie

in the muscle and form the arterial meshwork at the placental site. The walls of the arteries become thinner as the inner surface is approached. There exists in the uterus a system of blood-vessels which supplies the muscle with blood and also a system of blood-vessels which supplies the intervillous space. The principal reflex comes from the last-mentioned. The reflex requires a large supply of blood for the intervillous space, but the flow depends on the tonicity of the muscle as the blood-vessels run through this muscle. This is clearly shown in the illustrations (Figs.1-3). In the later months of pregnancy, when the woman stands up, the blood will have to flow partly against gravity.

The reactions of the general circulation are also to be seen most clearly in the later months of pregnancy. It is obvious that the increasing uterine contractions must temporarily increase the resistance offered to the blood flow. After each contraction there must be a freer inflow of blood to maintain a sufficient blood-supply in the intervillous spaces. Delivery will therefore demand the maximum of compensatory reactions on the part of the general circulation because of the increased resistance during labour. Clinically Fellner (1923) proved an increase in cardiac output and in blood-pressure at the beginning of labour. By observation with the capillary microscope in the nailbed the number of stases was seen to increase in the first phase of labour by 18 per cent, and in the second stage by 28.5 per cent (Hinselmann 1924).

In my opinion these favourable compensatory reactions in the general circulatory system are induced by the regional resistance in the uterus and are required to secure an adequate blood-supply for the foetus during and after uterine contractions. Parturition often pushes the function of the circulatory system to its physiological limits. It is often noted during labour that,

as a reaction to the vasoconstriction in the arteries of the kidneys, the urine contains. albumen and even casts. We have seen that for pregnancy and labour to proceed within physiological limits the following conditions must be fulfilled: the arteries of the uterus must hypertrophy adequately and the uterine muscle must remain in a state of tension which does not offer an abnormal resistance to the flow of blood. On the other hand the heart must be capable of enlarging its minute/volume output, the arterioles in the periphery must be capable of undergoing a certain degree of constriction, and the permeability of the capillaries must be increased within physiological limits.

Let us now consider the factors liable to cause complications. The term toxaemia is used, although we do not know of any specific responsible toxin. Many years ago I expressed doubts as to whether such a toxin would ever be found, since all the clinical phenomena typical of 'toxaemia' can be explained by definite changes in the circulatory system during pregnancy. It might be better to speak of hypertonia gravidarum, using the term eclampsia if the vasoconstriction of the arterioles increases to spasm.

The syndrome may be primary, if an abnormal resistance in the uterine circulation has to be overcome, or secondary, if the resistance in itself is normal, but the response to demands on the general circulation to supply the intervillous space sufficiently with blood is deficient.

Primary hypertonia, an increased resistance in the circulation of the uterus, will give rise to a reaction similar to an increased resistance in the circulation of the kidney. Goldblatt, Wilson and Byrom found that vasoconstriction of the renal arteries resulted in benign hypertension and constriction over a longer period gave rise to malignant hypertension. As the foetus re-

quires its oxygen constantly, the circulatory system of the uterus must be supplied with blood continuously. If the resistance increases, the reaction of the general circulalation will be an increase of the minute/volume output of the heart, vasoconstriction of the arterioles in the periphery, a frequently interrupted capillary flow with increasing oedema, general hypertension and, as a reaction to the general hypertension, vasoconstriction in the arterioles of the kidneys and other organs as already discussed in the physiological review.

What can be the origin of the increased resistance?

In the first place there must be an insufficient hypertrophy of the uterine bloodvessels and muscle. This is to be expected mainly in primigravidae as after having once undergone pregnancy the uterine muscles and vessels remain enlarged. From the illustrations (Figs. 4-9) it may be seen that in multiparae the muscle wall is thicker and the arteries, before as well as during pregnancy, are of a distinctly larger calibre.

A disturbance in the required cardiac function is to be expected if a cardiac lesion, antedating impregnation, already requires an increased minute/volume output to prevent decompensation. This holds good particularly for aortic stenosis and for women of an infantile type. The arterial system of these women is under-developed, a constitutional hypoplasia of the arterial system being responsible for subarterialization of certain organs. An infantile uterus is often the manifestation of subarterialization. The same aberrations are found in women with hormonal deficiencies which give rise to obesity; here also, the uterus may be in-The women in whom primary hypertonia and eclampsia occur are those of the young, infantile type and the obese type. Alvarez observed high blood-pressure in young women not yet full-grown.

According to von Zarday (1930), 90 per cent of patients with obesity show objective symptoms of disturbance of the general circulation. Hermann (1929), too, found aortic narrowing in 44 per cent of cases of eclampsia, a fact first noted by Lohlein. After the first pregnancy the uterus remains enlarged, the uterine vessels remain widened and so the uterus is better prepared for a subsequent pregnancy, if no damage has been suffered in the preceding one.

In the second place unfavourable developments are to be expected if the contents of the uterus are growing abnormally quickly. In such case the tonicity of the uterine wall will increase rapidly and the entry of arterial blood to the intervillous spaces, which is dependent on a normal tonus of the uterine wall, will be diminished because hypertonia of the uterine wall will give rise to an increase of the resistance.

This is to be expected in multiple pregnancy, hydramnios, a rapidly growing hydatidiform mole and, to an acute degree, in accidental haemorrhage. In multiple pregnancy, especially in primigravidae, hypertonia and eclampsia occur 5 times as frequently as in single pregnancy. In hydramnios complications are often observed. With hydatidiform mole the symptoms are often hyperemesis and pre-eclampsia. In a series of 30 women with molar pregnancy Page (1939) noted pre-eclamptic complications in 10. There were no complications in 16 before the 4th month. Of 14 between the 4th and 7th months 10 showed serious complications. In these women the contents of the uterus are growing rapidly and as the nutrition-reflex is stimulated most probably by the chorion, the demand for blood will be stimulated and will be abnormally intense, as long as the mole is active. In the beginning there will exist only a strong reflex, after the 4th month the

increased resistance will become of importance. The symptoms of pre-eclampsia will be superimposed upon the symptoms of hyperemesis. If the mole stops growing the complications decrease although the mole is not expelled.

Separation of a normally implanted placenta has its special place in pathology. As I have shown, accidental haemorrhage results from the rupture of an arterial vessel between the muscle wall and the placenta, where the arteries have a very thin coat. Without doubt nephritis and hypertension are predisposing factors, but as Young (1927) and Paramore (1928) have shown, there are patients without such lesions who develop accidental haemorrhage. I have treated women in whom the cause was an injury or other acute increase in the circulation of the uterus. Such cases are most important in showing the influence of a sudden increase of resistance in the uterine circulation. A retroplacental clot is formed. which in concealed cases will cause a sudden increase of tonicity of the uterine wall and a sudden increase of resistance in the uterine circulation. At the moment of rupture of the artery the muscle is not contracted and the blood will be squeezed between the lamellae of the muscle. Albeck (1920) found albuminuria in 67 per cent of his patients with concealed haemorrhage and in 40 per cent with revealed haemorrhage. The greatest resistance is to be expected in totally concealed haemorrhage. As far as I know cortical necrosis of the kidneys is found only in the concealed, never in the revealed variety. In the latter there is no severe resistance.

Secondary hypertonia. The resistance in the pregnant uterus is normal but the peripheral circulation is incapable of responding to this normal resistance and the nutritionreflex which demands a sufficient bloodsupply for the placenta. The consequent failure might arise from the low reserves of the general circulation, or from hypertension existing before pregnancy, or from disease of the peripheral vessels due to nephritis. There will not be a sufficient reserve present to compensate for the extra strain involved in overcoming the resistance in the side-branches of the circulatory system.

It is possible that the low reserve of the circulation may not have been noticed before pregnancy or that essential hypertension or nephritis may have pre-existed. A low-reserve circulation may be due to hypertonia or to eclampsia in a previous pregnancy. It will depend on the reserve of the general circulation whether failure will occur or not. Multiparae especially may go through pregnancy without difficulties provided that the extra demands for the circulation in the uterus are not too high. In the first 5 months signs of failure are not common, for they mostly occur in the later months of pregnancy, as is to be expected after my explanations.

Gibberd (1931) made it clear that 50 per cent of patients with primary hypertonia had renewed hypertonia in the next pregnancy, mainly when the disease had lasted longer than 3 weeks, although they had been without symptoms in the interval. He calls this "occult nephritis". Stander (1929) speaks of low-reserve kidney. should call this low-reserve circulation. Browne (1937) classifies all these cases as pre-eclamptic toxaemia: Although many such patients develop hypertension or nephritis after many years, there are also women who remain without symptoms when they are not pregnant. More complications are to be expected in essential hypertension, where the reserve is in most cases lower than normal. We know that essential hypertension in itself may be mild or severe. We may speak of essential hypertension in primigravidae only, as in multigravidae the

hypertension may be the result of the preceding pregnancy. I have an impression that the prognosis in essential hypertension is more favourable than in hypertension from low reserve after a previous pregnancy. If the hypertension has existed for a longer period and the vessels are sclerotic, the influence of pregnancy is always serious. Although some cases are described in which nephritis has been favourably influenced by pregnancy, this is exceptional. It is possible that the reactions of the general circulation to the pregnancy may be stronger than the demands of the uterine circulation. The mildest degree of nephritis may be considered to be a low reserve of the circulation. If the woman is not pregnant not all of the glomeruli are in function at the same time, during pregnancy the reserve may be too low. Chronic nephritis, and especially interstitial nephritis, is usually adversely influenced by pregnancy. We have shown that, especially in the later months of pregnancy, the arterioles of the periphery and also of the kidneys must constrict to compensate for the reactions in the circulatory system required to secure an adequate blood-supply to the uterus and its contents. Sclerotic vessels are unable to contract further and the arteries of the uterus will also be sclerotic and unable to dilate sufficiently. The effect will be an insufficient supply of blood to the intervillous spaces and the formation of infarcts. Infarcts are not always due to haemorrhage. Their formation may be due to a gradual interruption of the circulation of the intervillous spaces. The placenta is in many cases abnormally small. The foetus will not grow and will die in the early months. Death of the foetus can better be accounted for by deficient circulation in the intervillous spaces than by some unknown toxin. If the arterioles are still able to contract but the reaction is generally insufficient, the renal disease increases, the blood-pressure

rises, the foetus remains small and, in the later months, when the circulation in the intervillous spaces is insufficient, the foetus is born prematurely or dies in utero, the mother's nephritis meantime becoming worse. The exacerbation of the nephritis is expressed by increasing oedema, generally not as marked as in primary hypertonia. The blood-pressure is high and does not fluctuate, albuminuria is marked and the urine also contains blood-cells and casts.

Anaemia points to secondary hypertonia as do also sclerotic changes in the retina and a high blood-urea. Eclampsia results in secondary hypertonia earlier in pregnancy than in primary hypertonia. Eclampsia without convulsions is nearly always due to secondary hypertonia.

I shall now discuss some clinical facts, which are in favour of my theory and against the theory of 'toxaemia'.

The illustrations (Figs. 10, 11) show that the uterus of the eclamptic patient is much thinner and the arteries are smaller than in multiparous uterus.

The following table compares the size

farcts are rarely seen in primary hypertonia, where the vessels are constricted but not sclerotic. In secondary hypertonia with sclerotic vessels infarcts are much more frequent. The hypertension of the arterioles is observed on examination of the fundus oculi. Narrowing of the vessels with and without oedema was found by Wagener (1933, 1934) and Mylius (1928) in nearly all cases with a blood-pressure above 150 systolic and 100 diastolic. In primary hypertonia retinitis with sclerotic changes is very rare but sclerotic changes are to be expected in secondary hypertonia.

A strong argument against 'toxaemia' and for a disturbance in the circulation is death of the foetus. If the foetus dies in utero the general condition of the mother usually improves. The contents of the uterus diminish, the tonicity of the uterine wall decreases too, and the resistance is lower.

The hormonal reflex, which starts in the placenta and demands an uninterrupted circulation of blood in the uterus, will decrease slowly because the placenta will not

	Weight in g.	Circum- ference in cm.	Length in cm.	Width in cm.	
I. Primigravida (8 months)	1200	43	24	18	with placenta.
2. Eclamptic primigravida	950	33	19	18	with placenta.
<ol> <li>Multipara (9 months)</li> <li>Multipara (3 days</li> </ol>	1650			_	without placenta.
postpartum) 5. Eclamptic primipara	1300	40	21	16	without placenta.
(3 hours postpartum)	1100	35	19	15	without placenta.

and weight of 5 uteri, acquired by operation or necropsy.

Both with and without placentae the uteri of eclamptic patients are smaller and lighter than normal. The uterus is in many cases smaller than usual for the time of pregnancy. The children are often under weight. Dieckmann (1938) found 11 per cent under 2000 g. and 44 per cent under 3000 g. In-

die at once. A weakened reflex will continue as long as the placenta is functioning. During labour the resistance increases temporarily and in many cases a temporary rise of albuminuria and blood-pressure can be observed during parturition even in cases when the foetus has been dead for a long time. Powilewicz and Morace (1924) followed the progress of 94 patients. In 23

of the foetus, in 5 albuminuria was found again during labour. In 71 the albuminuria persisted and in 8 cases exacerbation was found during the second stage, owing to the more powerful contractions.

Intercurrent eclampsia is in my opinion not to be explained as a toxaemia, especially when the foetus survives. I cannot believe that with conservative treatment, such as rest, narcotics, possibly venesection, a toxin can be removed or a hormonal disturbance cured. Only the circulatory system is influenced by our therapeutic measures, rest in bed being the most important factor, making it easier to augment the flow of blood to the fundus uteri, if the patient is lying flat. Rest in bed without any other therapy leads to decrease of oedema (Wesselink, 1931).

The effect on renal function is caused by vasoconstriction in the renal circulation. Wesselink ascertained that when the intake of fluid was stable, the albuminuria could show variations of 2-20 per cent. It should also be mentioned that both kidneys are not affected to the same degree (Peters, 1922). Narcotics decrease the spasm of the vessels. Venesection does not influence the arterial pressure unless a very large quantity of blood is removed, but a moderate venesection of 300-400 ml. has a remarkable influence on the venous pressure, which lasts many hours (Eyster, 1929). In postpartum eclampsia the uterus usually contracts promptly and the actual loss of blood is often reduced to below normal. Thus the total quantity of blood retained within the circulatory system remains relatively large and this fact in itself is liable to interfere with a speedy return to normal conditions. The arterial pressure will in many cases fall only to rise again later. Probably the process of restoration is dependent on the extent and degree of pathological changes in the tissues and on whether regeneration is

possible quickly or at all. I believe that all the pathological-anatomical changes are to be explained by spasms of the arterioles. Braunmühl (1928) has shown that all pathological lesions in the brain are the result of spastic ischaemia. Fahr (1924) observed the same changes in the livers of dogs dying after poisoning with adrenaline. haemorrhages in the liver are to be found especially on the surface, where the arterioles of the hepatic artery pass into the capillary system, and where the vasoconstriction will be more distinct than in the area of the portal vein. Cerebral haemorrhage and pulmonary oedema are in most cases the causes of death.

If these opinions are correct, experiments on animals can never give a true picture of human eclampsia. The human uterus is one connected muscle which surrounds the contents as a whole, its contractions being aperistaltic (de Snoo, 1946). The resistance in this area is uniform, thus differing from the peristaltic uterus of most animals. Even if labour contractions set in, a peristaltic uterus will never give such resistance to the blood flow as does a contraction in an aperistaltic uterus. The erect position of the human body interferes with the uterine circulation as the largest amount of blood enters the uterus by the uterine arteries and has to be brought to the intervillous spaces against gravity.

### CONCLUSIONS.

The aetiology of eclampsia is to be sought in a disturbance of haemodynamic equilibrium in the general circulation. Normal pregnancy and labour cause a slight vaso-constriction in the periphery and an increased minute/output of the heart. At all times the nutrition-reflex of the pregnant uterus will urgently require a sufficient blood-supply to the intervillous spaces to guarantee the life of the foetus. The reflex is most probably hormonal.

Two forms of the disease should be recognized. The one is due to an abnormal resistance offered to the circulation of blood within the uterine wall, and the other is the result of a deficient adaptation of the general circulation to the requirements of the uterus in pregnancy and delivery. All clinical observations may be explained by circulatory deficiency in spite of a maximal attempt to respond to the nutrition-reflex of the pregnant uterus. The strongest arguments against 'toxaemia' are cases of intercurrent eclampsia and the exacerbation of clinical symptoms during labour long after the death of the foetus.

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# 9 OBSTRUCTED LABOUR DUE TO SEPTATE VAGINA

ΒY

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It is generally accepted that the presence of a longitudinal septum within the vagina is no barrier to normal delivery, and, indeed, the standard teaching is that in most cases one half of the vagina dilates during the 2nd stage of labour to accommodate the foetus whilst the other half becomes obliterated. It is recognized that occasional difficulty may arise, but the mechanism of such dystocia is not stressed nor are the results of failure to recognize obstruction due to a septum sufficiently emphasized in the majority of textbooks.

A vaginal septum may indicate the presence of deformity at a higher level in the genital tract and is often associated with a double uterus and cervix, but it may equally well exist as the sole deformity, and may then vary from a thin, narrow "string", which gives way before the advance of the presenting part, to a thick, fleshy partition extending between \( \frac{2}{3} \) and \( \frac{3}{4} \) the length of the vagina. In either variety the diagnosis of its presence should lead to increased care in the management of the labour.

Most of the recorded cases have been of septate vagina associated with uterus didelphys and they have been recorded because some coincidental disturbance of function or anatomy has precluded vaginal delivery. It was, therefore, thought worth while to record the following 2 cases as illustrative of the dangers attendant on vaginal delivery in such a condition and

because they illustrate that the danger is present in both types of defect, the vaginal septum alone and the vaginal septum associated with double cervix and uterus.

CASE 1. The patient, a primipara of 26 years, was admitted as an emergency with a breech presentation in advanced labour. No other diagnosis had been made and the patient had not been seen by a doctor though one had been called by the midwife in charge of the case.

The history was of intermittent antenatal care by occasional visits to the local clinic or midwife but the patient had not been examined within the last month or two. She was very vague about her dates but was considered to be due a month hence.

Spontaneous premature labour had commenced to hours before admission and had proceeded normally until the midwife was called; she, recognizing that the case was a primiparous breech, notified the doctor, who ordered the patient into hospital straight away. The patient gave no relevant past history except that she had had swelling of the ankles for 2 or 3 weeks.

On examination she was a florid, well-built woman, having strong uterine contractions, I every 3 minutes, and bearing down heavily with each pain. Temperature 99°F., pulse-rate 88, blood-pressure 158/100. Examination of her heart and lungs showed no abnormality and abdominal palpation revealed a uterus the size of 36 weeks' gestation, and a breech presentation, with the presenting part deep in the pelvis. There was gross oedema of the face, hands, feet and legs, and the urine showed a heavy albuminuria.

A vaginal examination was made and she was found to have a double vagina: there was an

antero-posterior septum dividing the introitus and extending upwards for 2/3 the length of the vagina. This septum ended above in a sharp, tightly stretched crescentic edge, over which it was just possible to hook the fingers. Further examination, aided by the use of a speculum, showed that the presenting breech was sitting astride the upper edge of the septum, lying as a complete sacroposterior having I buttock and flexed leg at the top of each half of the vagina. The foetal perineum was thus being thrust down on the taut crescentic fold with each uterine contraction.

Under general anaesthesia division of the septum was performed by clamping, cutting, transfixing and ligating in 3 "bites": this technique was necessary owing to the thickness and fleshiness of the membrane, and particular care was taken to protect the foetal perineum from injury. When this was completed full dilatation of the cervix was confirmed and a breech extraction of a living female child, weighing 4 pounds 3 ounces, was performed. An episiotomy had been done to diminish the risk of trauma to the premature foetal skull and by the time this was sutured the placenta had separated and was expelled. Examination of the vagina at this stage showed that the pedicles of the septum had already shrunk down till they were almost flush with the anterior and posterior vaginal walls and bimanual examination of the retracted uterus revealed no evidence of failure of fusion in the Müllerian system. The mother made an uninterrupted recovery, and 9th day examination showed no abnormality remaining in the genital tract, the tags of the membrane having almost disappeared.

During the puerperium, when the gross oedema began to subside, it was noted that her right hand was obviously larger than the left, and she volunteered that her right foot always required a larger shoe than the left foot; this led to a more complete physical examination which revealed a marked hypertrophy of the right foot and leg, right hand and arm, and right breast, with an equally marked hypertrophy of the left (opposite) side of her face. In addition, there was webbing of the 2nd and 3rd toes of the right foot and both feet showed a severe degree of pes planus. There were no signs of pituitary or other endocrine dysfunction and she was discharged on the roth day with lactation fully established: blood-pressure 135/100, and urine

free of albumen. On examination before discharge and again at the postnatal unit there was no clinical evidence of double cervix or uterus: the patient refused to submit to lipiodal hysterogram and there is, therefore, no final proof that the lack of fusion was confined to the vagina though all the clinical findings supported this. No abnormality of the renal tract was found on intravenous pyelography.

The baby was premature and showed signs of asphyxia pallida. It was not, therefore, fully examined at birth but was immediately treated for shock. It responded well and next day was found to have, in addition to bruising of the buttocks, a second degree laceration of the perineum. It was considered, by this time, to be potentially infected, and was therefore treated first with penicillin cream and then by half-strength Eusol packs. The latter treatment so successfully cleaned the laceration that secondary suture was attempted, but the stitches cut out so quickly that further efforts at repair were abandoned and it was allowed to heal by granulation. On discharge, the baby was gaining weight, was fully breast fed, and its perineum appeared to be healing well.

CASE 2. This patient, also a primipara, had somewhat sketchy antenatal care and stated that during the course of this she was never examined våginally. Her expected date of delivery was at the end of May 1938, and on April 10th of that year she went into premature labour. So far as she knows she was well during the pregnancy and the premature labour was spontaneous in onset and not associated with any trauma or pathological condition. The labour began at o p.m. and she states that she was delivered with chloroform and instruments of a living male child, weighing over 2 pounds, at r p.m. the following day. Since then she had had continual incontinence of urine though now, after 10 years, she has periods of dryness. Very little additional history of the delivery was obtained from the doctor and midwife in attendance. They recollected that there had been delay in the descent of the head, that forceps had been applied and that although the infant was small the delivery had been difficult.

Fourteen weeks later the patient was sent in to hospital, where a vesicovaginal fistula was found through which it was possible to pass 2 fingers into the bladder. There were also the remains of

a longitudinal vaginal septum on the anterior and posterior vaginal walls and these were continued across the vault of the vagina as a complete membrane dividing the upper third of the vagina into A small but normal cervix was present in each half, and lipiodol injection revealed a complete double uterus. The sequence of events appears to have been that during labour the descending vertex, presumably by pressure necrosis, had broken through the middle of the vaginal septum, thereby coming to lie on one side of the lower third of the membranes while the trunk and limbs remained on the original side. The efforts at delivery had then succeeded in tearing away this portion of the membrane and with it part of the neck of the bladder and the posterior wall of the urethra. In view of the extent of the fistula, repair was regarded as impracticable.

On examination recently, the vulva and urethral orifice looked normal, but as soon as a speculum was introduced and the posterior vaginal wall retracted, a gush of urine followed, and it was observed that the whole of the posterior urethral wall was deficient. The injury appeared to have involved the internal sphincter of the bladder also, for there was no evidence of control other than the somewhat uncertain one of the sphincter vaginae. The vaginal walls showed both anterior and posterior longitudinal ridges which passed upwards to end in a short membrane dividing the upper fourth of the vagina into two, each half containing a normal cervix. Owing to the thickness of the abdominal wall satisfactory demonstration of the double uterus was not obtained, and in view of the X-ray evidence for its existence, obtained during her previous stay in hospital, further investigation was not considered necessary. She was in good health and had not had any other pregnancies. Repair of the defect by Bonney's flap method is under consideration.

In commenting on these 2 cases the first important point is the absence of antepartum diagnosis in both, and it underlines the necessity for more adequate antenatal care, including the necessity of careful vaginal examinations at some stage in the antenatal period. The second point is that, as these 2 cases show, if a vaginal septum is found to be present, it is of great

importance to estimate its completeness and to establish the presence or absence of uterine maformations. If the septum is incomplete, as it was in Case I, then there seems to be no doubt that it should be divided before labour begins, for the likelihood of obstructed labour when the presenting part enters the vagina, be it vertex or breech, is high. If it is complete and associated with double uterus and cervix, as it was in Case 2, then although a normal vaginal delivery is probable yet a watch must be kept lest the descending foetus should rupture the membrane centrally and carry away the lower part, with either its anterior or posterior attachments: or become obstructed and be the subject of an operative delivery before the real mechanism of the obstruction is appreciated. Another such case was recorded by Keevil (1943) in which the lower end of the septum was carried away during a normal delivery and with it its attachment to the posterior vaginal wall and perineum. Strean and Portnuff (1948) also recorded a case in which the rupture of the dividing membrane occurred above the level of the cervix, giving rise to a similar type of obstructed labour.

The presence of a crossed hemi-hypertrophy or gigantism in Case I is of interest, though I have been unable to find any reference to its occurrence in association with congenital malformations of the genital tract: the patient was quite aware of its existence, was quite philosophical about it, and stated with complete certainty that it had always been present. In view of this assertion, together with the absence of any signs of pituitary or other endocrine disorder and the presence of the webbed toes, it seems reasonable to class this case with the asymetrical congenital gigantisms of unknown aetiology rather than the atypical acromegalics. There was no family history of gigantism.

#### SUMMARY.

Two cases of obstructed labour due to septate vagina are recorded and the mechanism of the obstruction in each case is described: it is pointed out that this condition may occur without any other developmental abnormality of the genital tract, although it is often associated with uterus didelphys.

The necessity of extra care in the conduct of labour in cases of septate vagina is stressed because of the increased risk of dystocia.

The presence of a crossed hemi-hypertrophy in one of the cases is noted and its aetiology is stated to be unknown.

My thanks are due to Professor E. Farquhar Murray and Mr. H. Harvey Evers for permission to publish these cases.

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# A NEW CONTRAST MEDIUM (RAYOPAKE) FOR HYSTEROSALPINGOGRAPHY

BY

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RINDFLEISCH, in 1910, was the first to attempt radiography of the uterus by injecting a bismuth emulsion. According to Douay, in his report before the Fifth Congress of the Association of Obstetricians and Gynaecologists at Lyons, September 1927, Lelorier was the first to inject an isotonic non-irritant fluid into the uterus with the object of determining tubal patency. His results were to have been presented before the Congress at Lille in 1912, but were never published. The use of Collargol for this purpose was described by Cary (1914), Rubin (1914), and Dartigues and Dimier (1916). This was followed shortly by halogen salts, used by Rubin (1920), and by Kennedy (1922). These, in turn, were completely replaced by the iodized oil, Lipiodol, introduced into surgery by Sicard and Forestier in 1922 and into gynaecology by Heuser (1925) and Forsdike (1925). This substance proved to be superior in many ways to previouslyused radiopaque substances and soon became very popular, particularly for diagnostic tests of tubal patency in cases of sterility. Later, other iodized oils such as Iodopine, Lipiodine, Pantopaque and Neohydriol were introduced. Good results and excellent opacity were obtained with these oils for several years, but reports from many investigators began to accumulate, describing objectionable features undesirable sequelae.

A review of these untoward results following the injection of iodized oils into

the uterus shows that in general they are due to the retention of the oil and to its slow rate of absorption. Even in the absence of infection, the oil thus retained acts as a chemical irritant and induces the formation of pelvic adhesions. A more pernicious effect on the reproductive organs is the retention of the oil within the Fallopian tube, where it may set up a foreignbody reaction which obliterates the lumen. The more serious complications such as pyosalpinx, pelvic abscess and peritonitis are also in large measure due to local retention and irritation, superimposed on latent infection (Rubin, 1947). These hazards had earlier led Rubin (1936) to conclude that, until a radiopaque substance should be available having the proper viscosity and density to demonstrate permeable tubal strictures and that degree of resorption which would leave no residue within the tubal lumen after a few hours, one would do well in cases of sterility to stop using lipiodol and oils chemically similar to it. More recently Titus (1947) has drawn attention to accumulating reports of oilembolism, sometimes fatal, following the use of lipiodol, and states that the position is serious because the purposes served never justify the risk. He concludes that iodized oil should not be used in hysterosalpingography.

In attempts to find the ideal opaque substance several preparations have been used. The crystalline iodine compounds proselectan (Swick, 1929), Diodrast

(Rubin, 1939) and Hippuran (Rubin, 1939) were found to escape too rapidly into the peritoneal cavity, being insufficiently. viscous. It then became apparent that something would need to be added to an aqueous solution to increase its viscosity retarding its absorbability. without Neustaedter and co-workers (1933) added a quantity of 50 per cent glucose solution. Titus and co-workers (1937) developed Skiodan-acacia, a solution containing 40 per cent of monoiodomethane sulphonate of sodium (Skiodan) in acacia 20 per cent. Several favourable reports on this substance have appeared but it has not given completely satisfactory results because of inadequate viscosity, and does not seem to have been widely employed. As a result of further research since 1938, Rubin (1941) introduced visco-rayopake for clinical trial. This is a combination of a crystalloid iodine solution\* with polyvinyl alcohol. It is soluble in water, is nontoxic, and does not gel or crystallize at room temperatures. Its viscosity (due to its 3½ per cent concentration of polyvinyl alcohol) has been shown (Rubin, 1941) to be fifty times that of skiodan with acacia and more than twice that of lipiodol. Rubin reported the use of this preparation in 8r patients and stated that the opacity was equal to that of the iodized oils, that the contrast medium remained in the Fallopian tubes long enough to permit radiographs to be made and that it was nevertheless almost completely absorbed after 30 minutes with very little evidence of local chemical irritation. He concluded: "It shares all the advantages of lipiodol and other iodized oils but appears so far to have none of their disadvantages." Since the publication of Rubin's paper, Goldberger (1943)

has reported the use of visco-rayopake in 72 patients, including 7 cases of sterility; Bernstein (1944) in 52 patients, including 38 cases of sterility; Norment (1945) in 20 patients; and Montgomery and Lang (1946) in 79 patients. All these authors share Rubin's enthusiasm for this new contrast medium.

In 1942, Kjellberg described a method of pelvigraphy in which 20 to 30 ml. of a water-soluble contrast medium were introduced through the uterus and Fallopian tubes for the purpose of visualizing, as negative shadows, the generative organs and other soft-tissue structures. Jefferiss and Samuel (1946), repeating this procedure, tried different water-soluble iodine preparations, pyelosil, perabrodil, etc., and found, in 18 cases, that any preparation used for intravenous pyelography gave equally satisfactory results. They conconcluded that the method was superior to the conventional one in determining tubal patency.

# PERSONAL INVESTIGATIONS. †,

It was considered, at the outset, that something more than mere repetition of the work of the first testers of rayopake should be attempted. It was felt that the claims made for its radiopacity, viscosity and absorbability required further evaluation. It was therefore decided to conduct the following experiments, in addition to a

<sup>\*70</sup> per cent solution of diethanolamine salt of 2, 4-dioxo-3-iodo-6-methyl tetrahydropyridine acetic acid,

<sup>†</sup>In December 1946, in New York, I received a supply of this preparation, still in the experimental stage, from Dr. I. C. Rubin for clinical trials at the Royal Samaritan Hospital for Women, Glasgow. Subsequent supplies were received through the courtesy of Dr. E. L. Sevringhaus, of Hoffmann-La Roche, Inc., Nutley 10, New Jersey. In a letter dated 8th August, 1947, Dr. Sevringhaus stated that the new opaque medium would be marketed as "Rayopake" and that the iodine-containing compound is now 50 per cent solution instead of 70 per cent as originally described. Unfortunately, Rayopake is not likely to be available in Britain for many months.

series of the usual tubal-patency tests in sterility cases:

- I. To deposit equal quantities of rayopake and an iodized oil (Iodatol) on either side of the pelvis in the course of pelvic operations, immediately prior to closing the abdominal wound.
- 2. To repeat this experiment, enclosing the preparations in slowly-absorbed gauze (Oxycel).
- 3. To compare the radiopacities *in vitro* by taking radiographs of equal volumes in identical containers.
- 4. To compare and contrast the relative viscosities of rayopake, iodatol and water at both room and body temperatures.
- 5. To compare the relative viscosities and radiopacities of rayopake and a water-soluble iodine preparation, used for intravenous pyelography (Pyelosil 35).

It was found that rayopake was rapidly absorbed from the pelvic cavity (Figs. I to 6). This confirmed the findings in hysterosalpingography that, usually, there was no trace of rayopake 40 minutes after its introduction, whereas iodized oil was often present weeks and even months later. It was also learned that, while the radiopacity of rayopake is quite satisfactory (Figs. I to 7), the shadow is not as dense as that of iodized oil (Fig. 8). The results of viscosity tests are shown in the following table.

#### Viscosities.

	Relative flow-time	Relative density	Relative viscosity		
	Results at	15°C.			
Water	I	I	I		
Rayopake	65	1.23	8r		
Iodatol	1		1025		
	Results at	37° C.			
Water	I	I	I		
Rayopake	38	1.23	46		
Iodatol	254	1.34	338		

It is apparent that the viscosity of iodatol at body temperature is more than 7 times that of rayopake. The viscosity of lipiodol (heavy variety) was found, in subsequent experiments, to be similar to that of iodatol.

It was also found that the viscosity of rayopake was 23 times that of pyelosil: their radiopacities were almost identical.

### SUMMARY AND CONCLUSIONS.

- I. A brief history of hysterosalpingography is presented.
- 2. Rayopake (50 per cent solution of diethanolamine salt of 2, 4-dioxo-3-iodo-6-methyl tetrahydropyridine acetic acid with 3½ per cent polyvinyl alcohol), introduced by Rubin in 1941, but new to Europe, has been used in experimental and clinical trials in 50 patients, with satisfactory results and no ill effects.
- 3. This solution is less viscous and less radiopaque than the iodized oils commonly used in Europe, namely, iodatol, and "heavy" lipiodol, but the viscosity and radiopacity are adequate. The apparent discrepancy in the results obtained by Rubin and myself, in comparative viscosity experiments with lipiodol and rayopake, appears to be due to the fact that we used different types of iodized oil. Rubin used American-made lipiodol, which appears to correspond to lipiodol (Lafay) "F" Fluide, which is much less viscous than the "heavy" variety.
- 4. The rapid absorption and the fact that it does not possess the undesirable properties of iodized oil are its most advantageous features. Its rapid absorption necessitates exposure of the first X-ray plate within a few minutes after injection.
- 5. It is agreed, with Rubin, that rayopake is probably the closest approach to the ideal radiopaque medium, yet introduced, for hysterosalpingography. Preparations

Fig. 2 Hysterosalpingogram (Rayopake).



5 minutes after injection into uterus and tubes.



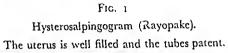
123 minutes after injection.



20 minutes after injection.



16 hours after injection.





X-ray photograph taken 24 hours later showed no Rayopake.

Гіс. 3

Rayopake deposited on right side of pelvis, and Iodatol on left side, at completion of pelvic operation.

The clear areas in a vertical row, mid-line, in Figs. 3-6, are due to Miehel elips in the abdominal wound.

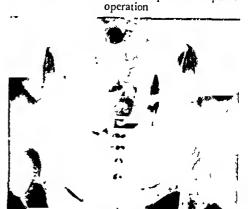


Immediately after operation.



24 hours after operation.

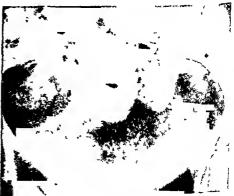
Fig. 4
Rayopake deposited on right side of pelvis, and Iodatol on left side, at completion of pelvic



30 minutes after deposition of opaque preparations.



4 hours after deposition of opaque preparations.



26 days after deposition of opaque preparations.

Fig. 5 Rayopake deposited on right side of pelvis, and Iodatol on left side, at completion of pelvic operation.



At conclusion of operation.



5 hours after operation



48 hours after operation.

Fig. 6
Rayopake deposited on right side of pelvis, and Iodatol on left side, at completion of pelvic operation. (Each contained within Oxycel gauze.)



20 hours after operation.



48 hours after operation.



2 weeks after operation.



44 days after operation. Note iodized oil still present.

Γισ. 7

Tubal oeclusion. Rayopake has not appeared through fimbriated ends.

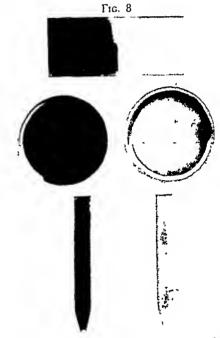
(Three previous tubal insufflations had shown non-patency at 250 mm. Hg.)



8 minutes after injection.



20 minutes after injection.



Groups of identical quantities of Rayopake (right) and Iodatol (left) in different types of containers to show comparative radiopacities

used for intravenous pyelography are insufficiently viscous.

- 6. With the advent of a non-toxic, rapidly absorbed dye such as rayopake, hysterography or hysterosalpingography can become readily adaptable to routine use.
- 7. It is agreed that, when supplies of this new medium become available, there should be no longer any place for an oily contrast medium for hysterosalpingography.

I am indebted to Dr. Donald McIntyre for clinical facilities and to Dr. R. Wright, Physical Chemistry Department, University of Glasgow, for the viscosity results.

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# RHESUS FACTOR ISO-IMMUNIZATION AND HAEMOLYTIC DISEASE OF THE NEWBORN\*

BY

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Much general interest has been manifest in the rhesus factor since the original report was published by Lansteiner and Wiener (1940). The obstetrician should be concerned in particular with this subject because certain complications which occur in obstetric patients are directly associated with incompatibilities of the rhesus blood-groups.

The rhesus factor is an antigen which is present in most individuals of the white population. This antigen is found chiefly on the surface and in the stroma of erythrocytes. The original work showed that sera obtained from rabbits previously immunized by injections of rhesus-monkey redblood cells had a selective agglutinating action on the red-blood cells of various human individuals. This rabbit antirhesus serum agglutinated the red-blood cells in 85 per cent of a large series of cases taken from the white population. This reaction was independent of the A, B, and O blood groups, as well as the M, N, and P factors. Immunization occurred on account of the so-called "rhesus factor".

Subsequently this work has been substantiated and expanded by other investigators in England and America. It has been shown that the incidence of positive

TABLE I.

Race	Percentage of positive reactions			
Caucasians	84.5			
Negroes	99.9			
American Indians	92.9			
Chinese	98.5			
Japanese	99.0			
Filipinos	100.0			

Some investigators in genetics suggest that only 85 per cent of the white population is rhesus positive in contrast to all other races, which give a positive reaction in 100 per cent of cases; when rhesus negative individuals have been found amongst these other peoples, the possibility of an admixture of "white" blood has always existed (Potter, 1947).

The clinical importance of this blood factor had been suggested in a previous report by Levine (1939). An interesting case of severe intra-group transfusion reaction occurred shortly after a patient had given birth to an hydropic infant. Cross-matching of her blood serum with many other patients' red-blood cells showed agglutination to occur in the majority of cases. Subsequently the bloods of other patients who had given birth to hydropic infants were tested and similar antibodies to those identified in immunized rabbits

and negative reactions to anti-rhesus serum varied in different races (Table I).

<sup>\*</sup> William Blair Bell Memorial Lecture, delivered to the Royal College of Obstetricians and Gynaecologists, London, on 2nd October, 1948.

were found in many instances. It was suggested that intra-group transfusion reactions could be caused by this rhesus factor antibody. In addition, erythroblastosis foetalis could be explained by the incompatibility between the blood of the intra-uterine foetus and that of its mother. Due to these interesting observations the pathogenesis of two troublesome medical problems was clarified.

My purpose, in this communication, is to discuss the clinical significance of conditions caused by the rhesus factor. Medical journals have been flooded by more than 700 publications during the seven-year period since the rhesus factor was reported as an entity (Potter, 1947). Many of these published observations are inaccurate, while others express unfounded opinions which tend to be misleading. In addition, the early literature on the rhesus factor is confusing because different terminologies are used by the various investigators.

In America the various sub-groups of the rhesus factor have been designated and accepted as Rh<sub>0</sub>, Rh' Rh" (Wiener, 1943). It should be realized that the rhesus factor is an antigen which can be divided into 3 varieties. Any individual who is rhesus factor positive has blood which possesses some part of the combination; there may be one, two or three varieties present in any rhesus positive person.

Antibodies against this rhesus factor are never a normal constituent of the blood, such as those of the A and B factors. It is only when the rhesus antigen is introduced into the circulation of a rhesus negative individual that antibodies are formed. This is encountered occasionally in clinical medicine with the use of whole-blood transfusions, and in some multiparous pregnancies. Consequently, we know three common anti-rhesus sera, which are designated as anti Rh<sub>0</sub>, anti Rh', and anti Rh''.

Table II shows the various reactions obtained in the Caucasian race using these 3 anti-sera. In addition, it shows the incidence of various rhesus sub-groups as found by these reactions.

TABLE II.

	nti- Rh"	Rh type (Phenotype)	Percentage
		(Filenotype)	incidence
_			12.3
+			r.r
_	+ :	Rh"	0.9
+	+	Rh' Rh"	0.0
_	- :	Rh <sub>o</sub>	I.I
+	_	Rh,	56.6
_	+	Rh,	16.0
+	+	Rh, Rh,	12.0
	- + - + - + - +	 + - + + + -  + -	- Rh negative + - Rh' - + Rh" + + Rh' Rh" Rh <sub>0</sub> + - Rh <sub>1</sub> + - Rh <sub>2</sub> + + Rh <sub>1</sub> Rh <sub>2</sub>

It was thought originally that the difference between rhesus positive and rhesus negative cells was the presence or absence of rhesus antigens. Subsequent studies have shown that rhesus negative cells do not have a void but possess a weaker antigen, the Hr (Levine, 1945). This was reported by Levine shortly after the 3 anti-rhesus sera were established, at which time he described this anti-Hr serum; Race and Taylor (1943) independently described a similar but more potent serum, which they labelled St.

In an effort to clarify the terminology of the various rhesus factor sub-types, the English group Coombs, Mourant, Race, Fisher, and Cappell (1946) suggested another system of classification. This is known as the Fisher classification and includes the reactions of all these newer blood sera. Table III is a composite of the English and American terminologies. In the earlier investigative stage many of the predicted reactions were purely theoretical. Actually, a large number of these reactions have been proven to exist.

Rh or Hr are inherited by allelic genes. Every individual possesses a pair of genes, one of which is derived from the father, the

	TABLE	III.
Rhesus	Blood	Sub-Groups.

		English	American	Rh, CDe	Rh, cDE	rh cde	Rh. cDe	Rh' Cde	Rh" cdE	Rh <sub>1</sub> Rh <sub>2</sub> CDE	Rh'Rh" CdE
	/ /	Anti-C	Anti-Rh'	+	<del>-</del>			+		+	+
₹.	١,	Anti-D	Anti-Rh,	+	+	_	+	_	_	+	_
ANTISERA	) .	Anti-E	Anti-Rh"	-	.+	_	-	-	+	+	+
Ε	1	Anti-c	Anti-Hr'	_	+	+	_+	_	+		
3		Anti-d	Anti-Hr.	_	_	+	<u> </u>	+	+		+
4		Anti-e	Anti-Hr"	+	_	+	+	+	_		-

other from the mother. Individuals of pure genotype such as Rh Rh (positive) or rh rh (negative) are homozygous, while those of mixed genotype Rh rh are heterozygous. Because rhesus positivity is considered dominant, all heterozygous individuals are classed as rhesus positive. Consequently, all rhesus negative individuals must be homozygous.

From a practical viewpoint, only those matings where the mother is rhesus negative and the father is rhesus positive should be considered. We are in complete agreement with Levine (1945), in that it is not necessary for the clinician to memorize the various rhesus factor sub groups and genotypes. In fact, it is in this regard where most medical personnel become confused. Ninety-two per cent of mothers who bear children that have manifestations haemolytic disease are rhesus negative and the father is rhesus positive. Only the serologist who has specialized training and who has the necessary potent sub-group anti-Rh and -Hr sera is competent to classify the other 8 per cent of cases; these include incompatibilities involving, A and B factors, (2) Hr factor, (3) and the differences between Rh sub-groups.

For these stated reasons the following clinical report chiefly concerns the incompatibility existing between rhesus negative mothers and rhesus positive fathers.

#### CLINICAL IMPORTANCE.

The majority of medical personnel are familiar with the mechanism of iso-immunization and little should be added in that regard. We know that the rhesus negative woman usually is immunized in two ways, (I) at the time of whole blood transfusion if she receives rhesus positive blood, even though there is ABO group compatibility; (2) the pregnant woman is immunized occasionally by her own foetus when it has inherited the paternal characteristic of being rhesus factor positive. In our opinion this latter type of immunization occurs at the actual time of delivery or when the individual has an abortion.

A general assessment with reference to rhesus factor iso-immunization shows that the incidence is not great. It is obvious that the importance of this condition does not lie in the frequency of its occurrence, but rather in the seriousness of subsequent manifestations when immunization occurs (Philpott, Latour and vanDorsser, 1946). It may prevent the raising of a family of healthy children. There is also a great danger of haemolytic reactions to blood transfusion: however, the risk of creating this latter condition is minimized if the transfusing of rhesus negative individuals is only performed when rhesus negative blood is used. It should be emphasized that one small tranfusion of rhesus positive

TABLE IV.

Foetal Mortality—Royal Victoria Montreal Maternity Hospital, 1941-46.

Foetal mortality 1941–46	D	ead born	Died v 24 h	vithin ours		after lours	
Cause	1941-	43 1944-46	1941-43	1944–46	1941-43	1944-46	Total
Prematurity { Cause Associated fa	ctor (54	4 .) (36)	11 (16)	30 (19)	8 (5)	8 (11)	65 (141)
Intrauterine asphyxia	111		4	7	2	. I	228 .
Congenital anomalies	46	5 37	7	5	10	10	115
Intracranial haemorrhage	14	1 12	· 17	15	I	7	66
Atelectasis	3	3 0	18	12	6	7	46
Erythroblastosis	9	9 8	2	7	3	7	36
Infection		0 0	I	О	0	3	4
Congenital syphilis		2 ` I	0	О	О	О	3
Cause unknown		3 0	0	5	I	0	9
	19:	2 165	60	81	31	43	572

blood may immunize the rhesus negative woman: As a consequence, this is prone to cause haemolytic reactions with any subsequent transfusion of rhesus positive blood. In addition, it may cause haemolytic disease in her infant even though pregnancy occurs years after the transfusion has been given (Discombe, 1948).

It has been suggested that rhesus negative infants may be immunized at birth by means of the intra muscular injections of rhesus positive blood. Before the advent of Vitamin K this procedure was common when certain infants were given blood to prevent haemorrhagic diastasis. It is not uncommon for adults to receive injections of whole blood for various complaints. Quite recently we examined the blood of a patient who had received repeated intramuscular injections of whole blood in a futile attempt to cure psoriasis. Her blood showed the presence of blocking and agglutinating antibodies in a dilution of 1:512. This patient happened to have rhesus negative blood. Her husband was the donor and his blood was rhesus factor positive.

Table IV shows all foetal deaths which have occurred in the Royal Victoria Montreal Maternity Hospital during the period from 1941–1946. This includes all babies who died and who were considered to be viable. The cause of death was corroborated by an autopsy examination in 76 per cent of cases. In this six-year period our figures show that haemolytic disease of the newborn is relatively uncommon as a cause of death.

In the two-year period 1946-1947 the laboratory service attached to our hospital completed rhesus factor determinations on the blood of 7,598 pregnant women. Table V gives 1.4 per cent incidence of iso-immunization.

TABLE V.
Antenatal Rh Tests.
Royal Victoria Montreal Muternity Hospital.

1946	4569 cases.	Percentage			
	Rh negative	•••		13.2	
	Iso-immunized	•••	•••	1.12	
1947	3,029 cases Rh negative Iso-immunized	•••	•••	14.7	,

It is now the rule in our obstetrical clinic that when a patient presents herself for antenatal care, a routine blood examination is completed. This includes red and white blood-cell counts, haemoglobin estimation, serology for the exclusion of

syphilis and the rhesus factor determination.

If the patient's blood proves to be rhesus negative, an attempt is made to test the husband's blood; unless he is proven to be rhesus negative similar to his wife, the patient's blood serum is tested for antibodies of the "agglutinating" (complete) or "blocking" (incomplete) types. These antibody titration tests are repeated with every visit.

During the last 4 years we have completed extensive antibody studies and our results have been published. (Primrose, vanDorsser and Philpott, 1947). The publication includes plotted curves for different grades of iso-immunized individuals.

Grade I. This shows very slight immunization with low antibody titrations, only becoming evident in the later weeks of pregnancy. The babies are born alive and progress favourably without treatment.

Grade 2. Late appearance of antibodies occurs. There is an elevation of blocking antibodies in the last weeks of pregnancy, but the titration is not above a dilution of 1:8. These babies are born at term showing some clinical signs of erythroblastosis of moderate severity. The blood picture at birth confirms this finding. Infants are usually saved by transfusion and supportive treatment.

Grade 3. During the later weeks of pregnancy there is a sharp rise in blocking antibodies to a dilution of I:32. There is frequently a sudden drop in the 2 weeks preceding term. The babies are severely damaged but may be salvaged by prompt action immediately after birth.

Grade 4. There is a sharp rise of blocking antibodies in the later months, above a dilution of 1:64, with some agglutinating antibodies, the prognosis for the baby is very poor an account of severe anaemia with oedema. Many of the babies are deadborn if allowed to go to term, death

having occurred one or two weeks before delivery.

Grade 5. The appearance of blocking antibodies, sometimes accompanied by agglutinating antibodies, is demonstrated in appreciable concentration of over 1:4 before the 20th week. There is a tendency toward rapid rise in antibody titres. Prognosis is hopeless if the baby is rhesus positive. The result is usually early miscarriage. In the case of a homozygous rhesus positive husband, the prognosis for this family is likely to be uniformly disappointing.

These results suggest the later in pregnancy that antibodies are demonstrated, especially if shown by a low titre, the better is the prognosis. Some curves have been elevated and then have tended to drop in the later weeks. It has been postulated that this drop is caused by increased foetal absorption of antibodies; this is accompanied by a poor prognosis.

It is not the usual occurrence for antibodies to become evident before the last trimester of pregnancy. As an average they appear at about the 30th to the 32nd week. Great care should be taken to keep a close check on titration levels the nearer a patient approaches term. We regard the appearance of the super-added agglutinating antibodies in rising titres as shadowing the prognosis. It is also our opinion that the prognosis is poor in cases where there is a history of previous catastrophes, if there are antibodies demonstrable in early pregnancy.

### TREATMENT.

During the last trimester, if antibody studies show a tendency to become persistently higher or if they suddenly take an appreciable drop, delivery before term should be considered. We prefer to deliver the woman of a premature baby which is definitely viable than to wait and permit

these increasing antibodies to cause widespread destruction of vital tissues in the foetus. It is recognized that premature delivery has its disadvantages, in that the babies born are immature, and that they also show manifestations of the haemolytic disease. However, our personal experience satisfies us that the premature delivery frequently is a life-saving procedure, providing that modern facilities are available for handling premature infants.

The method for delivery should be chosen to suit the individual case. Many of these women are multiparous when the cervix is soft and effaced. In these cases, delivery per vaginam may be the wiser approach. But a hard labour with a difficult delivery is not the best treatment for an ailing baby that is premature, and who has a predisposition to all forms of haemorrhage. If the cervix is firm we think a Caesarean section should be considered.

Where antibodies are demonstrated in any appreciable dilution, certain preparations are made as soon as the patient is admitted to hospital for delivery. These preparations are arranged by a team consisting of a transfusion officer, serologist and pediatrician, who also take charge of the baby immediately after birth. They have at their disposal rhesus negative blood which has been cross-matched against the mother's blood. In addition, there are facilities available to determine certain essentials without delay. These include the estimation, haemoglobin packed volume, icteric index, rhesus factor determination, together with any evidence of sensitivity present in the infant's red blood cells. Heparinized cord blood is used. The indicated treatment is carried out according to the results of these tests.

When doing haemoglobin estimations, it is well to remember that cord blood taken at the same time as that from the heel varies on an average of 20 per cent (Philpott,

Latour, and vanDorsser, 1946). The cord blood gives the lower reading. In order to avoid erroneous conclusions by comparing cord blood levels at birth with heel punctures at later intervals, it is a wise procedure to make an initial haemoglobin determination with blood taken from the heel.

Many cases of haemolytic disease of the newborn are recognized immediately at birth. These include types such as deadborn macerated infants, the hydropic babies, those with large liver and spleen, and those with marked jaundice. But there are others who do not have such pronounced evidence of the disease and may be classed as the sub-clinical types. These are diagnosed with difficulty or may be recognized only rarely as haemolytic disease of the newborn. Repeated blood studies reveal the definite diagnosis. In addition, one can follow the progress of the disease much better by blood changes than by any other method.

### BABIES' BLOOD CHANGES.

Haematologically, as well as clinically, a number of conditions may simulate haemolytic disease of the newborn (Potter, 1947; Wintrobe, 1947; Blackfan and Diamond, 1944), and successful therapy depends to a large extent upon early diagnosis. This difficulty is increased when haemolytic disease of the newborn is complicated by prematurity. In an intensive study currently in progress at the Royal Victoria Montreal Maternity Hospital; anaemia, marked macrocytosis, numbers of nucleated and other immature red cells, myelocytes and meta-myelocytes, have been fairly common findings in the blood of normal premature newborn infants. Similar findings have been observed by us and others in birth trauma, haemorrhagic disease of the newborn, babies born of diabetic mothers, conditions producing anoxia in the newborn such as pulmonary atelectasis, infection in the newborn—especially if associated with impaired liver function—haemorrhage in the newborn from any cause, and congenital syphilis.

There is no single haematologic criterion which permits the diagnosis of haemolytic disease of the newborn. Anaemia, which is usually present or develops shortly after birth, is also found in a number of the conditions mentioned above. The same may be said of large numbers of nucleated red cells, reticulocytes, and other immature forms, as well as the presence of a macrocytosis, (Damashek, Greenwalt and Tat, 1943; Reisner, 1943). Nor do the relative amounts of direct or indirect plasma bilirubin permit accurate diagnosis (Vahlquist, 1944-45). Thus it is realized that early and correct diagnosis in many instances is dependent upon careful clinical assessment, serologic studies of the expectant mother and the newborn baby, thorough haematologic study of the blood of the newborn infant, and at times serial repetition of these studies.

Prognostically, death or survival is not necessarily indicated by the severity and rapidity of development of anaemia and the intensity of the erythropoietic reaction, as reflected by the numbers of nucleated red cells and other young forms present. For instance, one infant made a complete recovery whose blood at birth contained 191,200 nucleated red cells per cubic millimetre; 35 per cent reticulocytes and 60 per cent haemoglobin. Other infants have died with mild anaemia, and with no more nucleated red cells and reticulocytes in their blood at birth than may be found in normal premature newborn infants. There seems to be some correlation between the degree of macrocytosis and survival of the baby. In an established case of haemolytic disease of the newborn, in whom prematurity has been considered, the degree of

macrocytosis is probably related to the amount of liver damage.

Severe haemolytic disease can destroy practically all the baby's rhesus-positive cells within the first 24 hours postpartum. The extra medullary haemopoetic system appears to be inactive for a period after birth; this occurs even when babies are allowed to become anaemic. It is our policy to purposely encourage this inactivity in rhesus positive blood formation by giving repeated large transfusions of rhesus negative blood. The rationale of this procedure is to prevent large amounts of new breakdown products from circulating through the liver. This is inevitable as long as antibodies present in the foetal circulation come in contact with rhesus positive red blood cells. Breakdown products probably play the role of causative factor of liver damage in this disease.

The acute haemolytic process tapers off in 3 to 5 days. However, the chronic haemolytic stage may be detected for a period of 6 weeks. After that time the condition gradually becomes less marked. We have noted a sudden unexplained drop in the haemoglobin during the second week of life; this occurs even though the antibodies in the baby's blood scarcely can be detected.

Our routine treatment starts as soon as the baby is born and it includes:

I. General supportive measures, such as clearing the air passages, maintaining body temperature by means of suitable incubation, and the continuous administration of oxygen, if indicated.

2. When the baby's blood shows the haemoglobin estimation below 100 per cent, transfusion of whole blood is given within a few minutes of birth. The slow drip method is used most frequently and the blood is given into the temporal vein. There is no svringe pumping.

The usual amount of blood given is 10 ml.

per pound of baby's body weight, but if the blood picture shows a marked anaemia, as much as 25 ml. per pound may be given. One baby weighing 8 pounds, whose haemoglobin was 18 per cent at birth, received 225 ml. of whole blood during the first 4 hours of life. Transfusions are repeated as often as indicated, to maintain the haemoglobin over 100 per cent for the first few days of life.

Anoxia and the usual sequelae such as central nervous system damage and atelectasis are prone to be associated with this severe anaemia. After the fourth day of life one may allow the blood to reach a lower level without too much risk. Many clinicians have thought that if the baby's clinical condition at birth appears good, active therapy is not indicated. Sometimes these babies develop grave symptoms very quickly and therapy is instigated too late.

We have performed several replacement types of transfusion. Five of these exsanguination transfusions were carried out using the original Diamond technique, shortly after birth a long nylon catheter is inserted into the umbilical vein and this extends upward to the vicinity of the right auricle. While using this method our results were poor. We had only one survival and 4 deaths which occurred during the transfusion or within a few minutes of its completion. It should be stated that all 5 cases chosen for this procedure showed marked manifestations of the disease. The usual method of repeated small transfusion has yielded better results. Our recent foetal mortality with this technique is approximately 15 per cent.

A newer method of replacement transfusion has been used to advantage by Diamond and it has also yielded good results in 7 of our cases. Whole blood is administered into the ankle vein, using the cut-down technique. The blood is withdrawn from the umbilical vein by means of

a special DuPont Vinylite tip, which is inserted for a distance of 2 inches. This can be performed any time within the first 24 hours of life. In fact, some delay after birth is advantageous. It permits the baby's temperature to reach a normal level and this delay also aids the infant in becoming adjusted to its new environment. Proper balance of blood intake and withdrawal is easily maintained; the average total intake should be approximately 300 ml. against 225 ml. withdrawal. The procedure should not be hurried, and a period of not less than 2 hours is recommended.

Most clinicians interdict nursing of these babies on the surmise that the mother's milk contains antibodies which will cause further blood destruction in the baby. We know that breast milk taken from mothers of the babies with haemolytic disease contains antibodies in high titres. But our experience has shown that milk containing high titrations of antibodies will not cause breakdown of red-blood cells in the nursing baby, absorption of antibodies does not occur. This observation has been corroborated in a recent publication by Cathie (1947).

The "follow-up" of cases born since 1943 has been interesting. This has been divided into 2 periods, the first, 1943–45, and the second, 1946–47. In the first group there were 30 cases which were diagnosed as haemolytic disease (Table VI).

Livebirths include 4 who died within the first week of life and 2 who died from pneumonia at later dates. Included in the 13 cases which are alive, there are 3 who have marked mental retardation and they also have residual spasticity. The 10 normal cases have had no greater incidence of morbidity than other infants of the same age period.

Our second group, Table VII, includes those babies born in 1946-47. There were

TABLES VI AND VII.

Royal Victoria Montreal Maternity Hospital.

Follow at a Co						
Follow-up of Cas Total cases	ses,	1943-4	5.			•
Livebirths	•••	•••	•••	•••	TO	30
Deadbirths	•••	•••	•••	•••	19 11	
Neonatal deaths	•••	•••	•••	•••		
Later deaths		•••	•••		1 2	
Alive to-day			•••			
Mental and phy					3	
Normal	•••	•••	•••	•••	3	10
Follow up, 1946-Babies H.D.N. (No trace Parents' reports	6–18  only		•••	•••	35 1 4 30	
Follow-up, 30 ca	ises.					
Mild manifestation					. 5	
Moderately sever	c	•••	•••	•••	12	
Severe	•••	•••	•••	•••	13	
Death (congenita	ıl he	art)	•••	•••	I	
Tardy in walking	z		•••	• • •	ı	
Mentally deficien			•••	•••	0	

49 cases of which 8 were deadborn. Thirty-five infants survived and were discharged from hospital. One case could not be traced and there were 4 instances where we have only written reports from the parents stating that these children were normal.

Reports of the remaining 30 cases are satisfactory for accuracy and detail, all being received from pediatricians or from organized baby clinics. These babies range from 6 to 18 months. Five cases were of the mild type and they did not require blood transfusion while in hospital. Progress was normal and they are well at the Twelve babies showed present time. moderately severe manifestations of the disease and they all required one or more blood transfusions during the first three weeks of life. The remaining 13 cases were of the severe types but they were successfully revived by the generous use of rhesus negative blood; three transfusions were of the replacement type.

In general, none of the babies of this

second group have been a disappointment to their parents, either in the matter of health or from the standpoint of mental development. Four have recovered from measles or whooping cough. Where routine blood checks were done there was a varying degree of anaemia, this persisted for many months after discharge from hospital despite the good general condition in these babies. In each case the anaemia gradually disappeared under conservative treatment. One baby died at 5 months, death being caused by congenital heart disease and not influenced by the effects of liaemolytic disease. Another child is 14 months old and weighs 25 pounds, it has not attempted to walk although it began to sit up at the usual age. The pediatrician who attends this case assures us that its mental and physical development is normal.

Study of both groups impresses one by the high incidence of deadbirths and deaths in the neonatal period. Where the babies survived and were discharged from hospital our results have improved with each succeeding year. Due to these observations we have concentrated on treatment which should tend to improve the condition of the babies at birth. Improved results show that premature delivery has aided considerably when indicated by variations in the antibody titres. In addition, we are investigating another feature of the disease which causes frequent complications and many deaths. Although this work is still in the experimental stage it is worth mentioning.

# DAMAGE TO THE LIVER AND THE USE OF METHIONINE.

When the pathological processes involved in haemolytic disease of the newborn were studied from the clinical and postmortem material, it was obvious that foetal damage to the liver was present in every case. This damage was thought to be long-

lasting, as shown by the follow-up on our cases and by the work of R. J. Drummond and A. C. Watkins in England. showed that the liver damage in young persons who were thought to be suffering from idiopathic congenital cirrhosis of the liver were really suffering from the late effects of haemolytic disease of the newborn. Taking these facts into consideration it seemed reasonable to attempt the protection of such foetal livers by the use of methionine, whose action as a liver protector had been the subject of so much recent investigational work. Gyorgy's work in animal experimentation showed beneficial results from the use of methionine in conditions which caused widespread liver damage (Gyorgy, 1944). Various reports have shown that there is a possible clinical value in cirrhotic forms of liver impairment (Beams, 1947; Miller, 1947).

Judging from available data on requirements, an arbitrary dosage of 5 g. daily of the crystalline methionine was given to each mother as soon as the first signs of immunization were detected during the pregnancy. This was considered to be greater than the normal maximum daily requirement for a pregnant woman. Such a dose would provide a therapeutic systemic concentration sufficient to deal with moderate liver damage. No attempt was made to assess the woman's daily consumption of methionine in her foodstuffs, and any so obtained was regarded as a supplement.

During the course of foetal development, as the need for methionine was manifested, the positive balance available in the maternal organism would be drawn across the placenta by the foetus. This is in accord with the generally accepted theory of foetal demand and maternal supply. Since methionine is an essential amino-acid its passage across the placenta would be uninhibited.

When receiving methionine the mothers

were seen every 2 weeks before the birth of their babies. A constant check was made on their consumption of the drug and on the antibody blood levels. No case of idiosyncrasy or untoward reaction to the drug was noticed and no patient had to discontinue taking the drug because of nausea. Some complained in having to take 10 fairly large tablets day after day. In some cases treatment was carried over a period of more than 150 days, a total of approximately 1,000 g. (Philpott and Primrose, 1948, to be published).

In milder stages, grades I and 2, where antibody levels in the blood were low the use of methionine was not advised, as we were confident that the babies would do well without treatment. However, quite arbitarily, a single case was selected in Grade 1, and three in Grade 2, and the others were used as controls. When it was obvious that any case was going to fall into the more serious Grades, 3, 4, or 5, a most intensive effort was made to talk the mothers into taking methionine with the assurance that we hoped by this means to obtain a live baby. All clinic cases were offered the chance but in each group a certain proportion could not be so persuaded. These cases, together with a few private patients whose doctors chose to carry on with observation of the titrations but without methionine, formed a convenient source of controls. other medication given these patients was a ferrous sulphate preparation of iron and a multiple vitamine capsule, both in routine use in our clinic.

Every case of haemolytic disease during the year 1947 and up to 1st May, 1948, is included in this report.

The deadborn group were subjected to careful pathological examination and the nature of their disease was studied. Samples of cord blood from the liveborn group were examined and the presence of haemolytic disease of the newborn was confirmed. This cord blood was examined in every case by a battery of liver function tests. Each baby was examined by at least 2 paediatricians and at no time before examination did they know whether a baby was receiving methionine or was a control case. Of the liver studies available only the cephalin-cholesterol flocculation was consistently affected in the severe cases.

Within the limits of the quantity of material available, 50 cases, the original premise is considered vindicated as shown in Table VIII.

chemical studies show a noteworthy difference between the two grades. The difference is most marked in the severe Grades 3, 4, and 5. In these 3 groups 19 control cases had one survivor or 5 per cent survival rate. Of the 12 cases receiving methionine, 10 babies were born alive, and 8 survived, giving a gross survival rate of 66 per cent.

It should be emphasized that in this disease we are using methionine purely as a liver protective. We know that antibody development occurs as usual in the mother and haemolysis of the red blood cells occurs

Table VIII.

Results with Methionine in the Royal Victoria Montreal Maternity Hospital.

					•	•	
(	Grade	Cases	Dead born	Alive born	Survived	State of liver	Cephalin- cholestero
Ι.	Control	10	nil	10	10	Slight to moderate liver enlargement	+++
•	Methionine	1	nil	r	ı	No liver enlargement	neg.
	(Cortrol	3	nil	3	3	Palpable liver and spleen	+++
II.	Cortrol  Methionine	3 3	ni!	3 3	3 3	No liver or spleen pa'pable	+
	Control  Methionine	3	2	ı	1	Liver and spleen enlarged	+++
III.	Methionine	4	nil	4	4	Liver and spleen just palpable	+ to ++
	(Control	4	4	nil	nil	Advanced erythroblastosis	?
IV.	{Control Mothionine	3	4 1	2	nil	Slight liver and spleen enlargement	++
	[Control	9	8	r	nil	Hydrops, etc., aborted	?
V.	Control   Methionine	9 5	1	4	4	Liver and spleen just palpable	++

Control—Control cases.

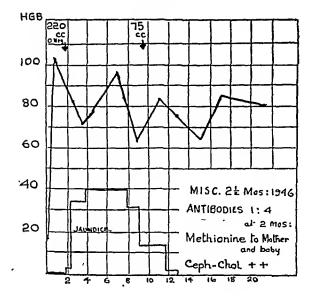
Methionine—Methionine cases.

The cases have been divided into grades, and the methionine group has been compared with the control group. The results reveal a striking difference between the control group and those receiving methionine. No claim is made for any significant difference in the survival-rate of Grades I and 2; although both the clinical and bio-

in the foetus. Our point is that we can treat severe anaemia in the newborn but we cannot adequately treat a severely damaged liver.

One baby in this series had a haemoglobin of 18 per cent and a corresponding low red cell count, but it responded well to transfusion treatment because the liver was not severely damaged. The cephalincholesterol test showed only minor impairment (Table IX).

TABLE IX.



All babies who are diagnosed as haemolytic disease receive ½ g. of methionine daily for at least the first 12 days of life. This is given .125 g. in 5 per cent glucose saline or in the milk. Practically all the babies have taken this mixture with avidity, almost denoting that they required it in their systems.

Prevention is the best treatment whenever it is possible. Relative to rhesus iso-immunization this could be accomplished on our present knowledge only by premarital typing of partners and advice against marriage of the woman who has rhesus negative blood with the man who possesses rhesus positive blood. For obvious reasons this would not be feasible: realizing that first babies are rarely affected by this disease, one could consider advising incompatible couples to limit the family to one offspring, but this suggestion is also impractical.

Experimental treatment of a prophylactic nature includes an attempt to suppress

formation of the rhesus antibody by injecting a stronger antigen such as typhoid or pertussis vaccine. Reactions to this therapy are troublesome, especially in the pregnant patient, and there are no apparent beneficial results. Drugs which are related to the anti-histamine groups (ethylene disulphonate) have been used, but further study is necessary to prove any benefit from their use (Kariher and Miller, 1947).

Specific action should be obtained when certain substances such as "haptens" are extracted (Levine, 1946). These have the power to neutralize antibodies without being antigenic themselves. In this manner a woman who has quantities of circulating antibodies could be freed of the danger of harming her own child (Carter, 1948). Dr. Carter presented an interesting paper in August 1948 at the meeting of the American Association of Blood Banks, this was referable to the extracting of "haptens" by a simple precipitation method. It is claimed that these haptens have the property of neutralizing the rhesus antibodies.

When there is a history of repeated tragedies and the wife is rhesus factor negative with the husband rhesus factor homozygous positive, means should be afforded to prevent subsequent pregnancies. addition, the general assessment of this problem makes one pause to consider the advisability of trying to save the pronounced case of haemolytic disease in the newborn. Under proper supervision mild cases progress favourably, but in those cases who have severe manifestations and who survive there is a moderately high incidence of physical and mental defects. When such cases occur it is most disturbing. However, our "follow-up" of cases shows that these can be prevented by prompt and adequate treatment. A recent brilliant article by Cappell (1948) also emphasizes this point.

### CONCLUSIONS.

- I. Importance of iso-immunization does not lie in its frequency but rather in the seriousness of subsequent manifestations.
- 2. Antenatal antibody studies aid in making a prognosis. Premature delivery may be indicated by variations in titration levels.
- 3. The liberal use of rhesus negative blood, if indicated, frequently prevents immediate or remote complications in the infant.
- 4. Foetal liver damage plays an important role in the progress of the disease. The use of methionine has been used as a liver protective with apparent good results.

I wish to express my sincere thanks to the Department of Pediatrics, Dr. Louis Lowenstein, our haematologist, Doctors J. P. A. Latour and Thomas Primrose for their co-operation and assistance in preparing this paper.

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## MASSIVE LYMPHANGIOMA OF THE FOETAL TRUNK AND SHOULDERS CAUSING DYSTOCIA

Report of a Case

 $\mathbf{BY}$ 

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IMPACTION of the shoulder girdle in head presentations is a rather uncommon complication of labour, although not so rare as one might assume from the scanty attention given it in many of the text-books of obstetrics. It is most likely to occur when the foetus is unduly large, because the circumference of the shoulder-girdle of the oversized infant is proportionally greater in relation to the circumference of the head than is that of the normal or small one. Dystocia due to abnormal local enlargement of the shoulders occurs rarely, so the following case may be of some interest

A woman aged 32 years, 2-para, 3-gravida, was seen at the antenatal clinic of the Winnipeg General Hospital on 16th August, 1940. Her past medical history was not remarkable. The 2 previous deliveries, in 1934 and 1936, were said to have been normal. The present pregnancy had apparently been uneventful save for slight oedema of the ankles during the last month. Her blood-pressure was 124/84. She refused further physical examination.

The membranes ruptured spontaneously on 24th August, at term. The patient thought the amount of liquor amnii was excessive. Labour began 7 hours later. At the first examination after admission to hospital the presentation was found to be vertex, the position right occipito-anterior, and rectal examination confirmed that the head was

engaged in the pelvis and the cervix dilating. Progress was rapid and she was taken to the delivery room, with the caput showing, less than 2 hours after the onset of labour. The occiput had rotated forward. Light chloroform-ether analgesia was given with the pains, and the head descended normally until its greatest diameter was just past the vulva. At this point descent ceased, and it was necessary to push the perineum up past the face in order to clear the baby's mouth. The uterine contractions continued strong and frequent but the head came no further down. The foetal heart-sounds became slow and irregular and the head deeply cyanosed. The patient was fully anaesthetized, a wide left mediolateral episiotomy was done, and the cause of the obstruction was sought. The anterior (left) shoulder could be felt overriding the symphysis pubis. Attempts were made to push it behind the symphysis by supra-pubic pressure but it would neither descend nor rotate laterally into the oblique diameter of the pelvis. The anterior axilla was sought in the hope of using it for traction, but it could not be identified as the bony landmarks were obscured by loose flabby tissue. In the meantime the foetal heart had stopped.

Upon the arrival of the senior author the patient was placed, in the left lateral (Sims's) position, the genitalia cleansed and re-draped, and the patient again deeply anaesthetized. With the left hand inserted high in the vagina behind the head it was possible to identify the posterior (right) arm, and, after disimpacting the shoulders somewhat by upward pressure, to bring it down in front of the

child's chest and past the head. A strong pull on the arm brought the posterior shoulder almost to the outlet; then traction on the head and arm, directed we'll posteriorly, brought the anterior shoulder under the symphysis and delivery was easily completed. The third stage of labour was uneventful. The episiotomy had fortunately not extended unduly and was repaired.

Convalescence was quite uneventful save for urinary retention which made catheterization necessary until the fifth postpartum day. As she had in the antenatal clinic, the patient modestly but firmly refused physical examination at the time of her discharge from the ward.

The child, a male weighing 9 pounds 4 ounces (4195 g.), showed a marked deformity of the upper part of the body, which was largely covered by multiple, loose, partially pedunculated tumours as shown in the photograph (Fig. 1). On the left the tumours involved the anterior aspect of the upper arm, the axilla, and the upper part of the chest wall: on the right they covered the entire upper arm and axilla and the side of the thorax down to the crest of the ilium. The margins of the masses were poorly defined. The growths at first glance suggested lipomata, but on closer examination were found to be cystic, the overlying skin being so thin in some places that the cysts could be seen shining through. On dissection multiple smoothwalled spaces were found, varying in size from pinpoint to 3 cm. in diameter. In some the fluid was vellow and coagulated, in others thin and watery, and in some blood-stained. On microscopic section the tumour was found to be a typical lymphangioma. All other organs were grossly normal, save for the lungs which were completely atalectatic and showed many petechial haemorrhages.

The great increase in bulk of the shoulder girdle is well shown in the photograph. The true bisacrom'al diameter was 13 cm., not abnormally large for the size of the child, but when the tumour was included the diameter across the upper arms was 18 cm. An onlooker remarked that the chi'd looked like an American football player wearing pads!

### LITERATURE.

Congenital lymphangiomata are not excessively rare, and may be present at birth or appear later. In a series of 28

cases presented by Singleton (1937), 16 were present at birth. The origin of these tumours is a matter of speculation. Early human embryos show 6 lymph sacs, 2 in the posterior abdominal wall, the other 4 at the roots of the 4 limbs. Those at the roots of the arms are called the jugular lymph sacs (Brash, 1943). Subsequently these sacs become converted into plexuses of lymphatics and into the vascular lymphnodes. There are two views concerning the development of the more peripheral lymphvessels: according to one view they arise by direct centrifugal extension from the endothelium of the lymph-sacs: according to the other view they arise in situ by transformation of mesenchymal lymphangioblasts into lymphatic endothelium, and develop secondary central connections with the direct derivatives of the sacs. The latter view seems the more helpful in the attempt to understand congenital lymphangiomata.

Singleton (1937), in an excellent discussion of lymphangiomata, divides them into 3 types: (a) simple or capillary, (b) cavernous, and (c) cystic. The distinction between the latter 2 groups appears to be mainly in the size of the cyst spaces. They can arise wherever a lymph-sac has existed. He considers them to be true blastomata, arising from undifferentiated mesenchyme capable of producing lymphatic vessels by activity and growth of lymphangioblasts. These vessels may be blocked later or be congenitally blind. It is very probable that normal-functioning lymphatics do not change to become involved in tumour development. The distribution of the tumours in the present case is consistent with development from the areas of distribution of the 2 jugular sacs.

From the obstetrical viewpoint, congenital lymphangiomata seldom cause serious delay in labour. Berkeley, Bonney and MacLeod (1938) state that most infants

with lymphangioma or cystic hygroma are females and are usually born prematurely. Sheares (1941), in a comprehensive review of foetal abnormalities causing difficult labour, says that "congenital tumours of the shoulders are mentioned in the literature, but no case causing dystocia has been described." Singleton (1937), however, discusses the case of a child having a large cavernous lymphangioma the size of a foetal head in the left axilla, which was so large that decapitation and puncture of the tumour were necessary before delivery could be completed. McPherson (1917) reported the delivery of a child with a multilocular cystic tumour involving the entire left side of the thorax and the greater part of the arm. It had not caused any difficulty in the delivery. Ealing (1943) recorded the case of a child with a large congenital haemangioma, 9 inches in circumference, extending above and below one elbow, which caused delay in delivery until the arm had been freed. The child died after 3 days and was found to have a much dilated heart, which one assumes to have been the result of an arteriovenous shunt through the highly vascular tumour. Dystocia is more often caused by angiomata of the neck (cystic hygromata), which may interfere with normal flexion of the head, as in Johnstone's (1932-33) case. This was, incidentally, the only tumour of the neck large enough to cause dystocia encountered in over 50,000 deliveries at the Royal Maternity Hospital, Edinburgh. Szerb (1936) described a case in which a cystic lymphangioma the size of a foetal head, situated between the right ear and shoulder, was successfully removed 31 hours after birth. The growth had caused considerable difficulty in a breech delivery.

### DISCUSSION.

Dystocia due to impacted shoulders deserves more attention than many obstet-

ric texts give it. It can be a real emergency and one which must be dealt with in the vitally important few minutes before the child dies of asphyxia. The multiplicity of manoeuvres advocated reveals the unfortunate fact that the mechanism of descent and rotation of the shoulder girdle is poorly understood and indeed does not seem 'to have been adequately investigated. Without a knowledge of the normal mechanisms and their possible variations assistance must be empirical. Too often the convenience of the delivered head as a "handle" leads to the use of undue force. causing permanent damage to the brachial plexus or injury of the cervical vertebrae and their ligaments. Often merely rotating the shoulder girdle into the transverse or an oblique diameter of the pelvic brim will suffice, and pressure on the anterior shoulder may accomplish this. Bringing down an arm, usually the posterior one, substitutes for the bisacromial diameter the axillo-acromial, said by Audebert (1934) to be 2 to 3 cm. less. The case here described shows the success of this manoeuvre, but it is not easy to do, especially when the posterior portion of the pelvic cavity is small and the hand cannot be introduced easily. Munro Kerr (1937) stresses the advantage of the Sims's position when manual correction of faulty position is attempted. Manly (1929), Brown (1933), Woods (1934), Barnum (1945) and McCormick (1947) have described methods of releasing impacted shoulders by rotation of the body of the foetus through a halfcircle, with or without bringing down an arm first. It seems very logical if one visualizes the shoulder girdle threading its way through the pelvis with a screw-like motion. As a final resort, usually after the death of the foetus, one may resort to cleidotomy to diminish the breadth of the shoulder girdle, though sometimes even this is not enough to release the obstruction.

In the present case, after early rupture of the membranes, the lower uterine segment was so closely wrapped around the fleshy foetal shoulders as to prevent their rotation. It may be argued that, as the child was dead, bilateral cleidotomy would have made delivery possible without the need for bringing down an arm, a difficult feat and not without risk even when carefully done. But identification of the clavicles is not easy, and was made more difficult here as they were obscured by the overlying tumours. Blind seeking with the scissors would have involved greater risk of damage to the maternal tissues.

### SUMMARY.

A case of impaction of the shoulders due to a congenital cystic lymphangioma is described. The recent literature on congenital lymphangiomata and their effect on labour is touched upon. Methods of dealing with impacted shoulders are briefly considered, especially as they apply to the management of the case described.

The description of the tumour is adapted from a report by the late Dr. Sara Meltzer, Assistant Pathologist, Winnipeg General Hospital. We are indebted to Professor I. M. Thompson, Department of Anatomy,

University of Manitoba, for assistance in the discussion of the embryology of the lymphatics.

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Photograph of foetus showing the distribution of the multiple lymphangiomata



# CALCIUM AND PHOSPHORUS METABOLISM IN PREGNANCY

(A Survey under War and Post-War Conditions)

### VI. POSTNATAL FINDINGS

BY

E. OBERMER, M.D., M.R.C.S.

FIFTY-THREE healthy pregnant women were originally selected for this survey. Their calcium intake, output and balance figures, together with tables and a discussion of both calcium and phosphorus balances throughout pregnancy, have been given in the first three papers of this series (Obermer, 1946a, 1946b, 1947a).

In 5 cases the experiment had to be discontinued in the early stages of pregnancy. The antenatal and labour findings of the remaining 48 cases were discussed in relation to the calcium and phosphorus balances, in papers IV and V of this series (Obermer 1947b, 1948). The reader is referred to these two papers for (a) a discussion of the reasons for the division of the cases into 7 groups and (b) details of the exact dosage of the supplements. The same plan is adhered to in the present paper.

The postnatal findings are divided into the same 7 groups:

Group A. Controls.

,, B. Supplement of "colloidal" calcium phosphate.

, C. As B, together with large doses of Calciferol.

,, D. Supplement of calcium phosphate B.P.

,, E. As D, together with the same large doses of Calciferol as C.

F. Supplement of Calciferol only in varying doses, all relatively small.

G. Supplement of Calciferol only in varying larger doses.

The group findings can be compared with the calcium and phosphorus balances during pregnancy by referring to Table I, reproduced from Paper V.

Table I.

Total Maternal Loss or Gain of Calcium and Phosphorus throughout Pregnancy. Mean for
each Group (Expressed in g.)

			Calcium		Phosphorus				
Group	Number of cases	Balance throughout pregnancy	Content of foetus	Total maternal loss or gain	Balance throughout pregnancy	Content of foetus	Total maternal loss or gain		
A	6	-155	<sup>2</sup> 5	~160	+28	14	+14		
В	6	- 20	2 <sub>5</sub>	~ 45	+42	14	+ 28		
C	7	+ 17	25	~ 8	+90	14	+76		
D	6	+ 1	25	- 24	-11	14	-25		
E	б	<b>—</b> I	25	26	+ 36	14	+ 22		
$\mathbf{F}$	10	- 90	25	-115	- 0.5	14	-14.5		
G	7	- 45	25	- 70	+17	14	+ 3		

TABLE II.

			THE LIT	,
Group	Case No.	Duration of lactation	Mother's health during first year	Baby's health during first year
A	1	2 months	Good	Bronchitis 4 months
	2	7	Good	Good
	4	3 ,,	Breast abscess 1 month,	Good
			otherwise good	
	5	9 ,,	Very good	Good
	6	6 ,,	Very good	Very good
В	13	F	Fair—tired	Cood
-	14	5 ,, 4 ,, ·	Good	Good Very good
	16		Fair—tired	Very good Very good
	17	7 3 weeks	Good	Good—chilblains at 6
	-/	3	3000	months
	81	5 months	Fair—tired	Good
			77	
С	25 26	9 ,,	Very fair—slightly tired	Very good
	26	5 "	Good	Very good
	27	I ,,	Good	Good
	28	5½ ,,	Fair—bad sleep owing to	Fair—poor sleep
	29	5½	bombing Fair—tired	Fair-poor sleep,
	<b>-</b> y	3/2 11	Tan- area	bronchitis 6 months
	30	5 ,,	Good .	Fair—poor sleep
D	19	7	Fair	Good to 7 months, then
		6 1 -	Can 1	flabby and catarrhal
	20	6 weeks	Good	Good Good
	21	9 months	Good Good	Good
	22	6½ ,,	Good except for headaches	Very fair—irritable at night
	54	4½ 5	Very fair—slightly tired	Very good
	23	5 "	, ory and buguesy area	
· E	33	6 ,,	Very fair—slightly tired	Very good
	34	Nil	Fair—tired	Good
	36	6 months	Fair—tired	Fair—bronchitis 7 months
F	39	3 ,,	Very fair—tired	Good until 8 months— croup
	10	41/	Good	Very good
	40 41	4½ ,,	Good	Very good
	41 43	4 7½	Fair—tired	$ ilde{ ext{Good}}$
	43 44	9 ,,	Good	Very good
	45	2 ,,	Poor-very tired	Very.good
	46	6 ,,	Very fair—slightly tired	Very good
		rT/	Good	Good
G	47 48	5½ ,, 4 weeks	Poor—very tired	·Good
	48	8 months	Good	Very good
	49 50	ı week	Very good	Very good
	50 51	6 months	Very good	Very good
_	51 52	3 "	Fair—pyelitis—slightly	Very good
	2-ر	•	tired	Very good
	53	Nil	Very good	very good

### POSTNATAL FINDINGS.

Of the 48 cases observed throughout pregnancy one case (case 3, Group A) had a stillborn baby and 2 (cases 38 and 41, Group F) had twins—a total of 49 babies. This figure was reduced to 48 by a neonatal death (from pneumonia) in case 35, Group E.

Details as to infant feeding and as to the progress of mother and baby were collected on a postnatal form sent to each mother.

only (case 41, Group F) had twins—a total of 40 infants. Weight charts were graphed out for 38 of these 40 infants. In a few instances the figures on the postnatal forms were given by the mothers themselves. The majority were supplied by infant welfare centres. In 2 cases the figures were mislaid.

The birth-weights have already been discussed (Obermer 1948, p. 144). The weights at 6 months and I year respectively are given in Tables III and IV.

TABLE III.

			***************************************		Weight	at 6 n	nonths			
No. of Group cases	No. of	Mean			Minimum			Maximum		
	lb.	oz.	g.	lb.	oz.	g.	lb.	oz.	g.	
A	5	17	6 4/5	7900	14	0	6350	22	I	10000
${f B}$	5	17	5 i/5	7855	14	6	6520	20	0	9100
С	5	16	10 2/5	7600	13	3	598o	17	13	8070
D	ŏ	17	5 2/3	, 7870	14	8	6580	19	ō	8665
E	3	16	8	7530	14	12	6465	17	12	8040
$\mathbf{F}$	7	16	2 3/7	7375	14	2	6180	19	8	888o
G	7	17	I I/7	77 <sup>8</sup> 5	15	0	6810	18	7	8410

TABLE IV.

					Weig	htatīye	ear			
Group	No. of	No. of Mean			Minimum			Maximum		
		lb.	oz.	g.	lb.	oz.	g.	lb.	oz.	g.
A	5	22	5 3/10	10,115	17	0 1/2	7,700	28	0	12,600
${f B}$	5	23	6 2/5	10,600	20	12	9,440	29	0	13,055
С	3	23	12 2/3	10,770	21	8	9,780	27	6	12,315
D	4	22	10 1/2	10,260	21	12	9,895	23	12	10,750
E	2	22	O	9,970	22	O	9,970	22	0	9,970
$\mathbf{F}$	6	19	12 1/3	8,985	17	12	8,025	22	6	10,140
G	6	22	7 1/6	10,170	21	0	9,550	23	8	10,635

This form was, of course, not filled out by cases 3 and 35. Two cases refused to fill out the form and 5 others were lost sight of, as they had moved away from London during the post-war period. Rough postnatal notes on the remaining 39 women are given in Table II.

INFANT WEIGHT CHART.
Of the 39 cases covered by Table II one

In view of the large number of factors involved in growth it is not surprising that there is no significant difference in the mean weights for the different groups.

When the figures for the increase in weight of each individual infant were plotted out against the average 48-hour ± calcium and phosphorus balances of the mother no correlation could be found. This was done for the increase in weight from

birth to the 12th week, 13th to 16th week, 17th to 26th week, 27th to 52nd week.

A comparison of the mean group increases at these different periods of the first year, however, showed definite differences. The numbers are too few to be statistically significant, but they are sufficiently marked to warrant tabulating (Tables V, VI, VII and VIII).

The mean figure for Group A in Table V is misleading. The baby in case 6 actually

gained 10 pounds 6 ounces (4,700 g.) from birth to 12 weeks. Case 6 was an exceptionally healthy and vigorous young woman and her husband was a young man in the American Air Force—a splendid physical specimen. If this baby were omitted from the group the mean for Group A would be 5 pounds 4 ounces (2,380 g.). This would make the Group C mean increase greater than all the other groups.

The figures in Table VI show an increase

TABLE V.

	No. of cases		·	Increa	se in We	ight—B	irth to 12th w	reek		
		No. of Mean			· · · · · · · · · · · · · · · · · · ·	Minim	um	Maximum		
Group		lb.	oz.	g.	lb.	OZ.	g.	lb.	oz.	g.
A	5	6	4	2835	4	6	2000	10	6	4700
${\tt B}$	5	5	Ġ	2440	2	7	1100	6	II	3040
C	õ	5	15	2695	3	15	1780	6	12	3065
D	6	5	3	2350	4	ō	1805	6	7	2920
E	3	4	11	2120	3	131/2	1740	5	10	2555
F	8		10	2090	2	10	1190	5	9	2530
G	7	4	111/2	2135	I	91/2	720	6	б	2890

TABLE VI.

				Increas	e in wei	ght—131	th to 16th week			
	NT- of		Mean	·····		Minim	ım		Maxi	mum
Group	No. of cases	lb.	oz.	g.	lb.	oz.	g.	lb.	oz.	g.
A	5		4	57º	0	II	310	2	3	990
В	5	I	ġ	710	0	15	425	2	6	1080
C	6	1	10 1/3	, 740	0	14	400	2	7	1105
Ď	6	_ T	5	595	I	ò	455	I	9	710
Ē	2	т	0	710	I	7	650	I	12	795
F	8	- T	9 3/8	720	1	, o	455	2	3	990
Ĝ	7	I	7 1/7	655	I	O	455	I	15	88o

TABLE VII.

				Increas	se in wei	ght 17	th to 26th week.			
			Mean	·		Minim	um		Max	imum
Group	No. of cases	lb.	oz.	g.	lb.	oz.	g.	lb.	oz.	g.
A B C D E F	5 5 5 6 3 7	2 3 2 3 3 3 3	10 4/5 0 3/5 13 1/5 3 1/2 5 1/3 9 2/7 8 4/7	1210 1375 1280 1460 1520 1620	2 2 1 1 3 1 2	4 3 4 11 0 11 8	1020 990 565 765 1360 765 1130	2 4 4 4 3 5 4	13 10 .7 15 8 12 6	1275 2100 2015 2245 1590 2600 1990

TABLE VIII.

	**	Increase in weight—27th to 52nd week.										
	No. of		Mean	•		Minimur	, .	, Maximum				
Group	cases		lb.	oz.	g.	lb.	oz.	g.	lb.	oz.	g.	
A	5	4	14 1/2	2230	3	0 1/2	1370	5	15	2680		
$\mathbf{B}$	5	6	1 1/5	2750	3	4	1470	9	0	4100		
`С	3	6	4 1/3	2840	4	8	2040	9	9	4355		
$\mathbf{D}$	4	5	15	268o .	5	I	2300	7	0	3180		
E	2	4	II	2125	4	4	1935	5	2	2325		
$\mathbf{F}$	6	4.	3 I/6	1910	2 `	12	1250	5	3	2355		
G	6	5	2 5/6	2355	4	8	2040	6	0	2720		

for Group C which is definitely higher than the others. This implies a correlation between the group means and the mean maternal loss or gain of calcium and phosphorus during pregnancy, as shown in Table I.

Table VII also shows the lowest increase of all groups for Group A (control). During this period the majority of mothers were still breast feeding. The largest mean increases were shown by Groups F and G—supplements of Calciferol only during pregnancy.

Table VIII covers a period when most of the infants were on bottle or mixed feeding. Only a few were breast fed during the first part of this period—see Table II. The factors involved are therefore more numerous and complex. Nevertheless, the mean increase for the control Group A is again the lowest, except for Groups E and F. Group E could be legitimately eliminated from this table, as the weights for two infants only were known for this period. The figures for group F are also partially invalidated by the fact that one of the twins (case 41) almost stopped gaining weight after the 7th month.

### DISCUSSION.

Far too little is known about the influence of calcium and phosphorus metabolism during pregnancy or lactation and postnatal development. That some influence

must be exerted can be deduced from what evidence we possess as to maternal calcium phosphorus metabolism and lactation. All the findings (Blunt and Cowan, 1930; Hunscher, 1930; Macy et al. 1930, 1934; Mendenhall and Drake, 1934) point to a constant calcium depletion of the mother throughout lactation, though phosphorus depletion is less frequent. Shohl (1939) points out that a generous intake of calcium and vitamin D might sufficiently increase the storage during pregnancy so that "lactation would not cause depletion beyond the normal or might maintain the calcium reserves throughout." Much more work has been done on cows and goats. Some of the literature is given by Crichton (1930). Some idea of the scope of American work on this subject can be arrived at by referring to Ellenberger et al. (1932), Hart et al. (1930) and Meigs et al. (1935). The evidence is suggestive, but not as yet conclusive, that large mineral and Calciferol supplements improve both the quantity and the quality of the milk, the maternal resistance to disease, and increase the growth-rate of calves. Even in this field, however, we do not know enough to understand the exact role of the different factors involved.

In the present survey it was not possible to persuade the women to carry out test periods during lactation. This would have involved further weighing and measuring of food and drink and the sampling of breast milk. The average working-class mother does not take too kindly to experimental work. The women could be persuaded to take a lot of trouble during pregnancy. They had plenty of spare time, and those who were given supplements were convinced that the baby would benefit. During lactation, however, they were kept too busy "looking after baby" to consider further experimental co-operation. It can be assumed, however, that their diets were similar to those consumed during pregnancy, minus the supplements. cases, therefore, it is probable that the calcium intake during lactation was suboptimal, if one accepts the figure given by Holmes (1945) of a minimum calcium requirement of 1.58 g. per day for a 59 kg. lactating woman. The same author's phosphorus requirement of 1.36 g. per day was probably met in the majority of these cases.

The mean group weight increase figures given in the tables show differences which are suggestive, in the light of the little that we know and the more that we are entitled to assume. These differences are born out by the weight graphs which will be published later. The general tendency of the weight lines of the infants, whose mothers had received supplements during pregnancy, was towards a more regular "straight line" progression. The mean weight increase of the A or control group was definitely lower for all the periods, except from birth to the 12th week. The possible explanation of this anomaly has been given above. Group C mothers showed the lowest net maternal loss of calcium and the highest gain of phosphorus during pregnancy. Group C infants showed the highest weight increases, both from the 13th to 16th week and from the 27th to 52nd week, and the second highest from birth to the 12th week. It must be emphasized, once more, that the numbers are too few to be of any statistical significance. That there are suggestive differences, however, in the different groups should encourage others to carry out similar experiments, in a more comprehensive manner and on a much larger group of cases. There can be no question about the great importance of calcium and phosphorus metabolism for mother and child, both during pregnancy and lactation. Adequate data to clarify the subject are urgently needed.

### SUMMARY.

I. Brief postnatal data are given for 39 out of the 53 women who took part in this survey, divided into 7 groups—I control and 6 given supplements of calcium and phosphate and/or Calciferol.

2. The weight charts of 38 infants, divided into the same groups, are discussed.

3. No correlation could be found between the average 48-hour loss or gain of calcium and phosphorus of the mother during pregnancy and the increase in weight, as shown on the individual infant's weight chart.

4. No correlation could be found between the maternal findings during pregnancy and the mean group weights of the infants at 6 months and 1 year.

5. The mean group weight increases are given, in tabular form and divided into periods—birth to 12th week, 13th week to 16th week, 17th week to 26th week, 27th week to 52nd week.

6. With a single exception the mean weight increases for the A or control group were lower than for the supplemented

7. The mean weight increases for Group C—the group in which there was the least maternal loss of calcium and the maximum retention of phosphorus during pregnancy—were greater than all other groups from the 13th to 16th week and from the 27th to

52nd week, and the second highest from birth to 12th week.

8. Stress is laid upon the fact that the numbers are too few to be of statistical significance. Nevertheless, our knowledge on this subject is so deficient that a few accurate data are considered worthy of publication. The hope is expressed that these suggestive findings will be confirmed or invalidated by experiments on a larger scale.

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# NORMAL PREGNANCY IN A CASE OF THROMBOSIS OF THE INFERIOR VENA CAVA

BY

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RECOGNITION and reporting of cases of thrombosis of the inferior vena cava, which used to be thought a very rare condition, has revealed an incidence higher than commonly estimated. One of the earliest records in the literature of this condition was in 1644, when Schenck described 2 cases which he found at necropsy. Bottini in 1893 appears to be one of the earliest surgeons who successfully ligated the inferior vena cava, the patient making a complete recovery without any complications. Jacob Hall Pleasants (1911) published a report of 18 cases diagnosed from amongst 400,000 patients admitted to the Johns Hopkins Hospital during the previous 20 years. Four of these patients had developed thrombosis of the inferior vena cava following puerperal sepsis (which after neoplasm he cited as the commonest cause) and, after studying in addition 41 similar cases quoted in the literature, Pleasants found that out of this total of 45, only I patient survived.

The present case of thrombosis of the inferior vena cava following pelvic cellulitis in a woman in whom conception occurred 10 years later, with subsequent normal delivery of a live child, is therefore of interest.

CASE RECORD.

The patient was aged 39, married, and her occupation was a club reception-clerk. She had

previously given birth to 3 babies at term and a 4th prematurely at 7 months' gestation following antepartum haemorrhage in 1931. She was admitted to the surgical department of the Postgraduate Medical School of London in October 1947 complaining of haemorrhoids. A history was given of their developing after the birth of her first baby in 1926. In 1938 a haemorrhoidectomy and also a uterine curettage had been performed in a cottage hospital and, after these operations, she developed pelvic cellulitis, which detained her in hospital for 6 months. She stated that during most of this time the legs were swollen. appeared to have recovered successfully, but 2 years later varicose ulcers broke out about the ankles. In 1943 she had an abortion at 8 weeks, and in 1946 another abortion, and for treatment of this was admitted to a London hospital where marked superficial varicositis were observed on the abdomen.

Upon general examination by us, in October 1947, large veins were noted coursing over the lower abdomen around to the flank and over the upper abdomen pursuing to the chest, the direction of the flow being headwards. The liver was not enlarged and the spleen was not palpable. Both legs showed moderate-sized varicose veins, and some oedema.

Proctoscopy revealed engorged internal haemorrhoids. The heart was normal in all respects, and the blood-pressure was 130/90. The diagnosis of thrombosis of the inferior vena cava was therefore made. A brownish vaginal discharge, however, attracted attention to the genital organs, where examination revealed the presence of a 5-months gestation and a small fibroid. She discharged herself from hospital at her own risk in December.

Five weeks later (12th January, 1948), she was admitted for observation and assessment of her physical ability to continue the pregnancy. Intravenous pyelography revealed satisfactory excretion in both kidneys; the Van den Bergh direct reaction was negative and the absence of bile in the urine excluded any liver morbidity. A catheter specimen of urine revealed pus cells, and a heavy growth of Streptococcus faecalis was cultured. The blood was Rh negative, and the haemoglobin content 64 per cent (Haden): 10 g. per 100 ml. The volume of fluid output relative to fluid intake was within normal limits. The varicosities in the anterior abdominal wall and legs were becoming more marked. It was decided to give the patient complete rest in bed and let the pregnancy continue.

Four weeks later (17th February), a phlebogram was performed by introducing 20 ml. diodone through a ureteric catheter into the right internal saphenous vein, at the saphenous ring (Stowers and Grossman, 1946). It was only found possible to introduce the catheter 4 inches. Unfortunately the skiagram was not satisfactory. At 24 weeks infrared photographs were taken to show the varicosity of the anterior abdominal wall (Figs. 1 and 2).

The urine was albumin-free throughout her stay in hospital except during mild exacerbations of right-sided pyelitis which caused the patient some distress from time to time, and she also suffered occasional pain in the fibroid owing to degenerative changes.

By 19th May (36 weeks), the patient had become generally uncomfortable, and the anus prolapsed, causing great distress and pain, so labour was induced by artificially rupturing the membranes. The foetal head presented in the right occipito-anterior position. Thirty-six hours later she delivered herself of a living male child weighing 6 pounds. The first stage of labour was long owing to uterine inertia, but the giving of oestrogens appeared to encourage uterine contractions. The second stage lasted only 10 minutes and, 5 minutes after delivery of the baby, the placenta was expelled from the vagina without haemorrhage.

The patient had an uneventful lying-in, and was discharged in a satisfactory condition with her breast-fed baby 21 days later. Only the haemorrhoids remained to cause any discomfort whatso-

ever After delivery the varicosities decreased as shown by the infra-red photographs taken 20 days (Figs. 3 and 4), and 15 weeks (Figs. 5 and 6) after delivery.

Upon re-examination at the time of the last photograph, the patient stated that she felt very well now, but that weakness had been marked during the first few weeks after leaving hospital. She thought that she now became more easily tired.

In general appearance she looked well and walked smartly without any disability. Examination of the legs revealed only mild varicosity and slight oedema of the right leg.

When questioned about her hours and times of duty in the job to which she had returned, it was obvious that her endurance exceeded that of many perfectly fit people of her age.

### REVIEW OF THE LITERATURE.

In reviewing the literature on obstruction of the inferior vena cava, it is surprising to find that so large a vessel can be obstructed and yet the victim survive and subsequently show so little disability.

The factors which influence the prognosis appear to depend upon 3 conditions: (r) whether it is a surgical ligation, or whether the obstruction is a thrombosis secondary to some neoplastic or inflammatory condition; (2) whether the renal veins are thrombosed, and if so, whether by a gradual process or suddenly; and (3) the age of the patient.

Wakefield and Mayo (1934) reported a very interesting survey of cases collected from the Mayo Clinic, in which obstruction of the inferior vena cava had been found in the postmortem room, or diagnosed in the clinics, and supplemented their series with 19 cases of surgical ligation from the literature. For purposes of diagnostic criteria, they compared the symptoms and signs of 9 patients from the clinics, in whom thrombosis was secondary to previous illness, with those of 19 who were reported to have had a surgical ligation. They found in the

former series of 9 that a visible collateral circulation developed insidiously in all cases in the abdomen and legs, cyanosis of the skin peripheral to the obstruction developed in 7, and oedema in about half of them. In the group of 19, all except one were ligated below the renal veins, visible collateral circulation did not develop in any case, and only 5 of the 15 cases who survived had persistent oedema of the legs. One of the 4 who died had had the ligation made above the right renal vein. The authors suggest that in cases of thrombosis of the inferior vena cava where large abdominal tumours are present or widespread intrapelvic inflammation causing extensive phlebitis, the deep collateral veins may not develop sufficiently, and in consequence a collateral circulation becomes visible and oedema develops. Gaston and Folsom (1945) reported 2 cases of surgical ligation at the level of the bifurcation of the aorta, and both completely recovered—one a woman aged 49, upon whom the ligation was performed because of phlebothrombosis of the lower legs, and who 4 months later showed no evidence of oedema or enlarged veins, and was able to perform light work. The other patient was a 71-year-old man with thrombosis of the left common iliac vein. The inferior vena cava was ligated at the same level. Pitting of the legs appeared a. few-hours post-operatively, but began to subside 36 hours later as long as the patient was confined to bed. Reappearance of oedema of the legs on the 12th day with ascites and albuminuria suggested that thrombosis had extended to the level of the renal vessels. Diuresis and subsidence of oedema and ascites followed the intravenous injection of diuretics, however, and subsequent studies of the venous pressure made in the arm and foot simultaneously showed a gradual fall in the venous pressure of the foot as the collateral circulation

developed. Three months later minimal oedema of the left leg, and enlarged veins over the abdomen and chest were the only signs present. Pfaff (1926) reported a case of haemorrhage into an abdominal cyst from a ruptured inferior vena cava, due to trauma, in a woman aged 48 years. At laparotomy, II days later, he ligated the inferior vena cava, and the patient made a good recovery.

Del Pino and Masciotra of Buenos Aires reported in 1929 a case of surgical ligation below the renal veins, because of injury during removal of a right-sided hydronephrosis in a patient 7 months pregnant. Neither cyanosis nor "chilling" developed in the lower extremities, which were carefully watched after the operation, but some oedema appeared in the right leg on the 8th day and lasted for 2 weeks, although the authors did not think that this was due to the ligation. Unfortunately she went into spontaneous premature labour on the day following the operation, and delivered herself of a live child, who lived 12 hours. The mother made a complete recovery, and only the loss of the baby marred the success of the case.

Fitzgerald (1943) also reported a case, in a man aged 31 years, of thrombosis of the inferior vena cava, spreading from a thrombosed left femoral vein, developed through trauma in lifting a heavy weight 9 years previously. True to the observations made in the 9 cases diagnosed in the Mayo Clinic and reported by Wakefield and Mayo, this man showed marked abdominal collateral circulation and oedema of both legs. According to the report, when last seen, "he felt quite well".

Osler and McCrae (1927) state that thrombosis of a renal vein can occur without any marked symptoms—pain and tenderness in the kidney region, albuminuria, scanty excretion of urine, etc.—provided it develops gradually. This certainly

agrees with the description given by Keen (1940) who found thrombosis of the inferior vena cava in a dissecting-room body: this subject had been an inmate of the infirmary for the last II years of his life, yet varicosity of the right leg was the only clinical abnormality ever observed, and this had been disregarded, as he walked without complaint. Keen states that the renal veins were thrombosed, and in view of the perfect collateral circulation draining the kidneys, he suggests that the thrombosis must have begun low in the inferior vena cava early in life, and that the gradual encroachment on the renal veins by the thrombosis was counterbalanced by the youthful resiliency of the venous system in developing an efficient collateral circulation.

Surgical ligation of the inferior vena cava above the renal veins, however, is reputed to have been successfully performed in 1902 by Turpesa in 3 cases out of 4. Gosset and Lecene, 2 years later, similarly ligated the inferior vena cava, but their patient died. Thereupon they initiated a series of experiments with dogs. They found that death occurred invariably when the inferior vena cava was ligated above the renal vein. Leotta in 1907 confirmed these experiments. Bejan and Cohn in 1911 pursued this research in animals further by placing the ligature between the renal and suprarenal veins. The 5 animals so treated all survived, but 4 others in whom the ligature was placed above the suprarenal veins, all died. Addis and Lew (1939) were also interested in the significance of thrombosis of the renal veins, and as a result of experiments with rats of various ages, they found that when they tied the inferior vena cava above the level of the renal veins, the survival incidence was proportional to agethe younger the rat, the greater were its chances of survival.

It is difficult to estimate to what extent these experiments may claim to be applicable to human beings, but all surgeons who have reported cases within recent years stress that their ligatures were applied below the level of the renal veins, and attribute their success to this. Of the 19 surgical ligatures quoted by Wakefield and Mayo, in only I instance was the ligature made (by necessity) above the right renal vein, and it would appear certain that this sudden occlusion was the cause of death

A series of physiological experiments and observations were carried out by Burch and Winsor (1943) on 5 patients (aged 21, 21, 27, 31 and 67) following ligation of the inferior vena cava for therapeutic reasons, between 8 and 18 days after surgical opera-They emphasized that ligation had been performed below the renal veins, and little discomfort had been experienced by the patients. In one observation series, they recorded the venous pressure in the feet, compared it with that in the arm and found that it was markedly raised in all cases, but gradually fell as the collateral circulation developed. Re-examination 10 months later showed that the pressure had not returned to normal, although the oedema had disappeared in the legs of 3 of them: it did persist, however, in the 67year-old patient. (The fifth patient had died in the meantime—cause unknown.) In the light of Addis and Lew's experiments, and Keen's remarks, it was only to be expected that the 67-year-old patient would exhibit evidence of difficulty in establishing a collateral circulation. Similarly, this might well be the explanation of the visible collateral veins, which developed after surgical ligation of the inferior vena cava in the 71-year-old patient reported by Gaston and Folsom.

The anatomy of the collateral circulation in thrombosis of the inferior vena cava has been described in detail by Keen, after dissection of the body in which this con-

dition was discovered in the dissecting room. The thrombosis extended from the common iliac veins to the groove in the liver, where the hepatic veins join the inferior vena cava. He found that the kidneys were drained mostly by dilatation of numerous peri-nephric veins, which on the right drained into a dilated sub-costal vein, and on the left into the inferior hemiazygos vein. The pelvic organs (excluding the rectum) were drained partly by a large vein accompanying each ureter to the suprarenal plexus, and partly on the right side, with the veins of the right lower limb, by fresh anastomotic channels opened up in the direction of the deep circumflex iliac The right leg and ilio-lumbar veins. showed considerable varicosity, but there was none in the left leg, which drained via a patent common iliac vein to an azygos vein running behind the inferior vena cava to the dilated sub-costal vein.

### CONCLUSION.

This case not only supports the findings of other observers in that the inferior vena cava can be permanently obstructed and yet the patient recover and live a moderately active life, but it also demonstrates that such a patient of child-bearing age can conceive and ultimately give birth by spontaneous delivery to a live child, and even suffer no apparent physical deterioration.

I have pleasure in thanking Professor James Young for his permission and encouragement to publish this case; Mr. M. R. Ewing, F.R.C.S., of the Department of Surgery, for collaboration; Mr. E. V.

Willmott, F.R.P.S., and Mr. E. A. Sheppard for the infra-red photography; and my wife, Mary M. C. Foulkes, M.A., for translation of foreign literature.

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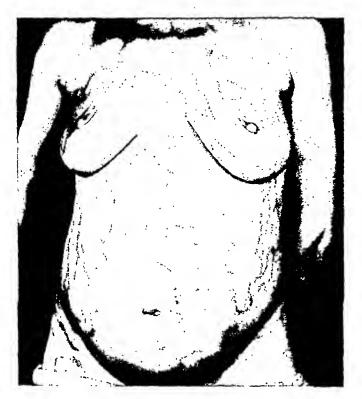


Fig. 1. At 24-weeks' gestation.



Fig. 2. At 24-weeks' gestation.



Fig. 3. Twenty days after delivery.



Fig 4 Twenty days after delivery.

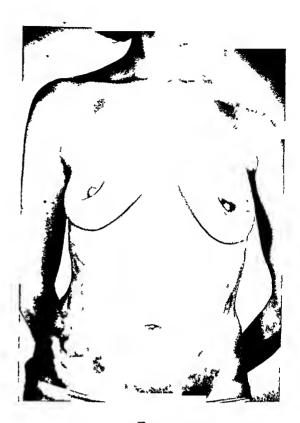


Fig 5. Fifteen weeks after delivery



Fig. 6. Fifteen weeks after delivery

# DYSGERMINOMA OVARII (Report of a Case)

BY

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AND

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THE patient was admitted on 13th March, 1945. She was a 20-year-old woman, who had been married 5 months. Her menstrual history was normal and she had never been pregnant. She complained of a mass in the abdomen, which she first noticed soon after marriage. It started low down; later, as it increased rapidly in size and almost filled the whole abdomen, the patient had become short of breath on slight exertion.

On examination her general condition was moderate, pulse 98; blood-pressure, 140/90; the blood picture was normal and the urine contained a trace of albumen, although the urea clearance test and blood non-protein nitrogen were normal. The secondary sexual characters were normal.

The abdomen, although much distended, moved with respiration; there was a bossed mass arising from the pelvis, and reaching up to 2 fingers' breadth below the xiphisternum. It mainly filled the left side of the abdomen, and also encroached on and occupied most of the right side. Its consistency was generally hard. It had a limited amount of mobility from side to side, but not from above downwards. There was no tenderness, and shifting dullness could not be detected. The left loin was partly filled by the tumour.

On vaginal examination a conical cervix was found pulled high up and in to the right side of the pelvis. The body of the uterus was undersized, fixed to the lower part of the tumour, and sinistroflexed. There was a large, hard, irregular tumour filling the left and anterior segments of the pelvis and displacing the uterus posteriorly and to the left side.

A tentative preoperative diagnosis of dysgerminoma of the ovary was made by the junior author. The grounds for this diagnosis were: the age of the patient, the hypoplastic uterus, the rapid growth of the solid tumour, the absence of ascites or other frankly malignant clinical signs, and the absence of menstrual disturbances or other hormonal effects. Although no dysgerminoma of this size had been reported previously, the reasons stated above induced us to take this as our first diagnosis.

Operation. The senior author (assisted by H. K. T.) explored the abdomen on 27th March, 1945. The tumour was found arising from the left ovary; the greater omentum, the descending colon, and the anterior abdominal wall were adherent to the tumour, and the adhesions contained large dilated veins. Moreover, the tumour was densely adherent to the left broad ligament and to the hypoplastic uterus.

After severing the adhesions, the tumour was removed with the uterus and both adnexae. No palpable lymph glands were found.

The patient had an uninterrupted recovery and left the hospital in good condition on 22nd April, 1945. She was sent after discharge to the Radiological Department of the University Hospital, where she received deep irradiation therapy of the pelvis. She was last seen on 23rd February, 1948; no abnormality could be detected on examination, and amenorrhoea was her only complaint.

Pathological report. The tumour sent was 20×14×25 cm., and hard in consistency except in some small areas near the anterior surface, where it was soft. Many dilated veins were present in its capsule and showing on the surface. The uterus was adherent to its lower pole and was hypoplastic. The Fallopian tubes and right ovary showed no abnormality.

On microscopic examination the tumour was found composed of diffuse sheets of large round cells with large vesicular nuclei. Some mitotic figures were seen, though anaplasia was not marked (Fig. 1). The tumour cells were surrounded by a loose oedematous connective tissue stroma which was densely infiltrated with lymphocytes.

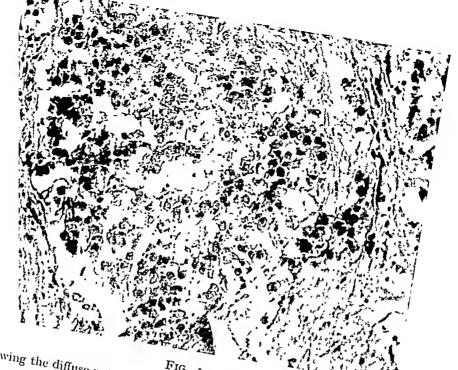
Diagnosis. Dysgerminoma of the left ovary.

### DISCUSSION.

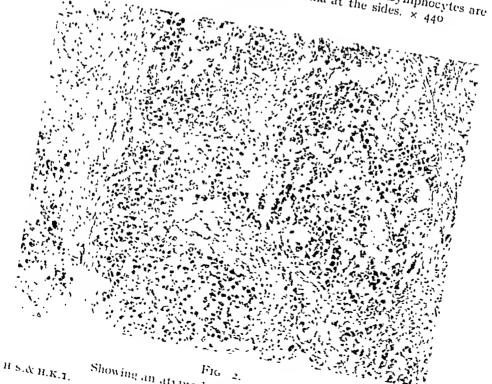
Dysgerminoma of the ovary is a rare ovarian neoplasm; it is a "neuter" dysontogenetic tumour (Novak, 1946; Spencer and Reel, 1947) which is found in the ovary, testicle or hermaphroditic gonad (Barzilai, 1943; Novak, 1946; Meyer, 1931b; Greenblatt and Pund, 1938). Schiller (1934) reported a dysgerminoma of the uterus; he believed that extraovarian dysgerminomata may be due to simultaneous anaplastic growth in anlagen of

indifferent gonadal tissue left over from early embryonic life at various points along the Müllerian duct. But Novak, Meyer, and many others have disputed this possibility, and have attributed the presence of extraovarian dysgerminomata to malignant spread from a primary ovarian lesion (Novak and Gray, 1938).

This tumour has been given many obsolete names; one of these, given to it by Chevassu, still obtains in French literature, i.e., seminoma (Novak, 1946). Kleine (1934) called it "large-cell carcinoma" (Grosszelliges Karzinom). Robert Meyer (1930, 1931a, 1931b) gave it the wellrecognized and time-honoured name "dysgerminoma ovarii", and condemned the term seminoma, which conveyed an erroneous impression about its origin. According to this pathologist, the tumour arises from rests of mesenchymal cells of the early sexually undifferentiated gonad, i.e., before its development into an ovary or testicle (Barzilai, 1943; Novak, 1946; Meyer, 1931a; Novak and Gray, 1938). In an embryo 7 weeks old or less, it cannot be certain to which sex the gonad is to be assigned (Keith, 1913), and its cells may give origin to a dysgerminoma if they persist into extrauterine life (Russell, That is why this tumour is found in the testicle as well as in. the ovary; it has also been found in the ovotestis of a true hermaphrodite (Novak, 1946). On the other hand, Giest (1942) postulates that it arises from certain cells of the surface epithelium of the anlage of the ovary; Meigs (1934) believes that it may result from a one-sided development of a teratoma. Teilum (1946) recently classified it as one type of "gonocytoma" —a group of tumours arising from a particular testicular anlage in the ovary (the medullary cords). Others consider it a special type of sarcoma, as it is a malignant neoplasm of the mesenchymal tissue of the



Showing the diffuse pattern of dysgernmona ovarii. Lymphocytes are seen in the connective-tissue stroma at the sides. × 440



s.&  $n_{K,T_1}$  Showing an atypical alveolir pattern  $\rightarrow$  120

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ovary (Barzilai, 1943; Spencer and Reel, 1047); as a matter of fact, many cases have been formerly misinterpreted as sarcomata (Gittins and Hawksley, 1932).

The gross characteristics of this tumour are not pathognomonic; it may be bilateral (Barzilai, 1943; Bourne, 1945; Long, Ziskind and Storck, 1941; Chaney and Greenblatt, 1938; Schiller, 1936) or unilateral (Novak, 1946; Dockerty, 1942; Peel, 1943; Giest and Spielman, 1943). Its size can be as small as a plum or as big as a large water-melon, practically filling the abdomen (Marek and Phillips, 1947); the largest specimen reported up to 1938 was  $25 \times 17 \times 15$  cm. (Russell, 1938). The tumour is usually rounded and knobby, though the surface is smooth; it is typically "rubbery" in consistency, but large tumours with secondary changes may be spongy and friable. It is surrounded by a fibrous capsule that remains intact until the advanced malignant stage, when it gets invaded by the tumour tissue and the surface becomes fixed by adhesions to the neighbouring structures. There are at least two recorded specimens with torsion of the pedicle (Novak, 1946; Klein, 1934). Ascites may be associated with it (Novak, 1946; Russell, 1938). The cut surface is greyish pink, homogenous and brain-like. Necrotic areas and interstitial haemorrhages are commonly seen in large tumours; cystic spaces are infrequent and small.

The microscopic picture is characteristic; the tumour is made up of parenchyma-cells arranged in patterns that are surrounded by connective-tissue stroma. The tumour cells are very fragile and need special preparation of the specimens; classically they are uniform, large, polyhedral cells with welldemarcated cell boundaries. The cytoplasm is abundant, granular, eosinophilic, and rich in glycogen. The nuclei are central, large, and round; each nucleus

contains 2 or 3 nucleoli. Mitotic figures are frequently seen. The sections give a feeble fat-staining reaction. The cytoplasm tends to dissolve in paraffin sections, leaving a collapsed cell-outline and a vacuolated interior (from the lipoid nature of the cell contents) (Russell, 1938). If a specimen is fixed in formalin, the cytoplasm shrinks, leaving the nuclei packed together and the cells then resemble those of a round-cell sarcoma. This is probably why a dysgerminoma has repeatedly been mistaken for a sarcoma. The tumour cells are arranged in certain patterns; in the diffuse or medullary pattern (Fig. 1) the cells are found forming large sheets with interspersed thin connective tissue strands. In the columnar pattern the cells are arranged in single layers separated from each other by connective-tissue septa. In the alveolar pattern, the most common, there are groups or nests of tumour-cells surrounded by a connective-tissue stroma (Fig. 2). The connective-tissue varies in amount and is generally less near the centre of the tumour; more connective-tissue and less cellularity in any tumour indicate a lower grade of malignancy (Fauvet, 1934, 1936). The stroma is typically an oedematous fibrous tissue invaded by lymphocytes (Russell, 1938; Long, Ziskind and Storck, 1941); large horse-shoe giant-cells may also be present. That is why tuberculosis has been suspected in some reported tumours. The giant-cells are concerned with removal of lipoid material resulting from breaking down of the tumour (Schiller, 1936). Regressive changes are frequently seen near the centre of a tumour, e.g., haemorrhage, necrosis, and cystic degeneration (Schomaker, Glascock, and Chapman, 1947).

This tumour is undoubtedly malignant (Barzilai, 1943; Novak, 1946; Novak and Gray, 1938; Giest and Spielman, 1943; Föderl, 1938; Mazel, 1947); but some authorities still consider it a relatively

benign tumour (Russell, 1938; Bourne, 1945; Schiller; 1936; Crossen and Crossen. 1944; Greenhill, 1943; Schneider and Vesell, 1947). Döderlein (quoted by Novak, 1946) has found 25 per cent of 53 reported cases which he studied as having extrapelvic metastasis. Even those who believe in its relatively benign nature give this tumour a 5-year survival rate; this rate, though varying from 60 per cent (Greenhill, 1943) to 23 per cent (Föderl, 1938), still means that this tumour can be malignant if left long enough. It invades the neighbouring organs and later metastasises in the regional lymph glands (Barzilai, 1943; Novak, 1946), the omentum, the viscera, and the bones (Stoia, Stanciulescue and Cioc, 1939).

The tumour is "neuter", i.e., it has no sex hormone activity (Barzilai, 1943; Novak, 1946; Meyer, 1931a; Shaw, 1945;

Spielman and Morton, 1938).

Numerous workers have demonstrated a gonadotrophic hormone in its extracts; excessive amounts of this hormone in the patient's urine can give a positive Aschheim-Zondek reaction (Barzilai, 1943; Russell, 1938; Giest and Spielman, 1943; Shaw, 1945; Spielman and Morton, 1938). Gough (1938) claims a masculinizing activity for this tumour; others believe that it may have an inhibitory influence on normal female physiology (Long, Ziskind and Storck, 1941). Both these views are dismissed by the majority of writers, who believe in its neutral nature.

It is a rare ovarian tumour, which is three times less frequent than the granulosa-cell tumour of the ovary, and it accounts for 3 per cent of all primary malignant ovarian tumours (Novak, 1946; Föderl, 1938).

Dysgerminoma of the ovary is found in young patients, while in the testicle it is rarely seen before the age of 40 (Schiller, 1936); 70 per cent of the females affected are under 20 years of age (Greenhill, 1943).

The youngest case recorded was in a child 4 years old (Russell, 1938), and the oldest in a woman 52 years old (Fauvet, 1934, 1936). The tumour has been repeatedly removed during pregnancy, labour, and the puerperium (Novak, 1946; Russell, 1938; Schomaker, et al., 1947; Schneider and Vesell, 1947; Nyst, 1940; Stabler and Thomson, 1937; Rojas, 1946; Abernethy, 1943; Falk and Bunkin, 1947). There were 300 cases reported up to April 1947 (Schneider and Vesell, 1947), of which Novak (1946) examined 17 and Föderl (1938) 13.

The most common age-group affected is between 10 and 20 years of age (Novak, 1946; Chaney and Greenblatt, 1938). It is commonly found in patients with underdeveloped genitalia; several reports were also published of cases seen in pseudohermaphrodites and in true hermaphrodites (Barzilai, 1943; Novak, 1946; Meyer, 1931a; Greenblatt and Pund, 1938; Long, Ziskind and Storck, 1941; Neumann, 1930). But it is definitely more commonly found in women with normal genitalia (Novak and Gray, 1938; Selye, 1946). Seegar (1938) studied 79 cases from the literature, without any evidence of true or Clinically the pseudo-hermaphroditism. tumour has no characteristic signs or symptoms; it is a rapidly-growing solid ovarian tumour, which may be unilateral or bilateral (Barzilai, 1943; Novak, 1946; Long, Ziskind and Storck, 1941; Föderl, It retains a certain amount of mobility in many cases; degeneration, though rare, may give rise to a febrile general reaction (Marek and Phillips, 1947), night sweats and leucocytosis (Long, Ziskind and Storck, 1941). Menstruation is not affected by the tumour. Otherwise a dysgerminoma gives the clinical picture of an ordinary solid ovarian tumour (benign or malignant). All cases reported in the literature were diagnosed only by the pathologist.

Some surgeons prefer conservative surgery in the treatment of these tumours (Giest and Spielman, 1943; Greenhill, 1943; Sailer, 1940); this is done when the tumour is unilateral, free of adhesions, has an intact capsule, and especially so if it is detected in a young girl. In these cases only the affected ovary is removed; the idea is to give the young patient a chance to become pregnant (Greenhill, 1943; Schneider and Vesell, 1947; Kleitman, 1946; Seegar, 1938). On the other hand, when a tumour is bilateral, adherent, or infiltrating it is considered malignant (Long, Ziskind and Storck, 1941; Dworzak, 1935), and radical surgery is advised—the tumour, the uterus, both adnexae, and if possible the infiltrated organ are all removed. Deep irradiation of the pelvic organs and the regional lymphglands is always indicated in these cases, as these tumours and their secondaries are very radiosensitive (Barzilai, 1943; Novak, 1946; Novak and Gray, 1938; Russell, 1938; Dockerty, 1942; Peel, 1943).

### CONCLUSION.

A case is reported on account of its interesting features; the diagnosis was suggested before operation as the patient was young, and the tumour was solid and rapidly growing, and the uterus was hypoplastic. Furthermore, it showed no hormonal influences and it was not accompanied by ascites or other frank malignant clinical signs. It is probably the largest dysgerminoma so far recorded.

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### **ERRATUM**

In the obituary of the late Dr. J. H. Willett, in the October issue of the Journal, the invention of the scalp forceps for placenta praevia was mistakenly attributed to him. The Editor is anxious that this wrong impression should be removed as soon as possible. The inventor was Dr. J. A. Willett.

## ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

A special meeting of the Council was held on Friday, 1st October, 1948, at the College House with the President, Sir William Gilliatt, in the chair.

The Honorary Fellowship of the College was conferred on Dr. Emil Novak, of Baltimore, U.S.A.

Allan Frederick Hollinrake, of Ontario, was admitted to the Fellowship of the College.

The following were admitted to the Membership of the College:

Ian Struan Robertson Bain. Henrietta Elizabeth Banting. Trevor Lewys Stanhope Baynes. Samuel Behrman. Douglas Charles Aitchison Bevis. Charles Christopher Bowley. Tristam St. Vincent William Buss. Lloyd Woodrow Cox. Mary Elizabeth Egerton. Thomas Elliot Elliot. Gilbert McIlwrick Forsyth. Havold Derek Freeth. George Taylor Gibson. John Hartley Gibson. Andrew Graham. Alfred Henry Grenz. Constance Amy Grey. Harold Bickford Hattam. Carl Clifford Henneberg. Ebbie Hesselberg. Dennis Woodfall Higson. John Colgate Holman. Kenneth Robert Hudson. Alun Gareth Jones. James Barclay Joyce. William Thomas Kenny. George Gladstone Kerster. Robert Arthur Hugh Kinch. Samuel Lask. Thomas Loftus Townshend Lewis. William Macfarlane. Stephen Herbert Madden.

Helen Margaret Mayer. Eiohn Lynn Forsyth McConnachie. John Macdonald McKiddie. Gordon William Heyes Millington. Frank Lionel Edward Musgrove. James Raymond Norris. John Joseph Francis O'Sullivan. Joseph Henry Patterson. Anthony Cecil Pearson. William Henry Peek. Stanley Dreland Perchard. David Prysor-Jones. Edward Harford Rees. Stanley McRae Reid. Hujohn Armstrong Ripman. Donald Norman Struan Robertson. Basil Walter Sanderson. George Alfred Silley. Alan Ambery Smith. Tom Smith. George John Sophian. Christine Margaret Stacey. Patrick Christopher Steptoe. Christopher Seymer Newton Swan. Ralph Arnold Thatcher. Gwyn Stuart Thomas. Robert George Whitelaw. Rhys Meyrick Williams. Martin Sadler Williamson. Harold Geoffrey Wolskel. Peter Spence Wright. Ratcliffe Bowen Wright.

# THE TWELFTH BRITISH CONGRESS OF OBSTETRICS AND GYNAECOLOGY, 6th, 7th and 8th JULY, 1949

To be held in the Friends Meeting House, Euston Road, London, N.W.I.

President: SIR EARDLEY HOLLAND.

Hon. Secretaries: A. Joseph Wrigley and Ian Jackson.

58 Queen Anne Street (Royal Ćollege of Obstetricians and Gynaecologists), London, W.I.

Wednesday, July 6th.

Morning Session, 10 a.m. (Chairman: THE PRESIDENT).

The Congress will be declared open by the Minister of Health.

"Modern Caesarean Section." Introduced by Mr. C. McIntosh Marshall (Liverpool).

Afternoon Session, 2.0 p.m. (Chairman: PROFESSOR HILDA LLOYD)...

(1) Guest Paper ("Endometriosis"). Dr. Joe Meigs (Boston, Mass.).

- (2) "The Methods of Assay and Clinical Significance of Pregnanediol in the Urine." Introduced by Professor C. F. Marrian (Edinburgh) and Dr. G. I. M. Swyer (London).
- 8.45 p.m. Reception by the President and Council of the Royal College of Obstetricians and Gynaecologists at the University of London, Bloomsbury, W.C.1.

Thursday, July 7th.

Morning Session, 10.0 a.m. (Chairman: SIR WILLIAM GILLIATT).

"Essential Hypertension in Pregnancy." Introduced by Professor George W. Pickering (London) and Professor F. J. Browne (London).

Afternoon Session, 2.0 p.m. (Chairman: Dr. John Hewitt).

(1) "The Management of Pregnancy in Diabetics." Introduced by Mr. John H. Peel (London) and Dr. W. G. Oakley (London).

(2) "Hernia of Pouch of Douglas." Introduced by Mr. Charles D. Read (London).

8.o.-10.30 p.m. Reception by the President of the Congress at the Zoological Gardens by courtesy of the Council of the Zoological Society of London.

Friday, July 8th.

Morning Session, 10.0 a.m. (Chairman: PROFESSOR O'DONEL T. D. BROWNE).

"Modern Concepts in Diagnosis, Treatment and Prognosis of Carcinoma of the Uterus."

(1) "The Diagnosis by Vaginal Smear." Dr. J. E. Ayre (Montreal).

(2) "Pre-Cancerous Cellular Changes in Carcinoma of the Cervix." Professor Gilbert I. Strachan (Cardiff).

(3) "Prognosis based on Biopsies." Mr. Glucksmann (Cambridge).

(4) "The Operation of Pelvic Exenteration." Dr. Joe Meigs (Boston, Mass.).

A Discussion will follow each Paper.

Afternoon Session, 2.0 p.m. (Chairman: Dr. E. Chalmers Fahmy).

Discussion on Maternal Mortality. Introduced by Sir William Gilliatt (London).

7.45 p.m. Congress Banquet in Guildhall.

Owing to the difficulties that exist at the present time in arranging hotel accommodation, travel, etc., will all those who hope to attend please apply as soon as possible to A. J. Wrigley, F.R.C.O.G., Hon. Sec., 58 Queen Anne Street (Royal College of Obstetricians and Gynaecologists), London, W.I.

## REVIEW OF CURRENT LITERATURE

The Journal is fortunate in being able to run this Review in conjunction with the Abstracting Service of the British Medical Association. All the abstracts of this service which cover obstetrical and gynaecological literature and literature on the new-born are at our disposal. The Review will, however, contain in addition abstracts and titles of articles which, though not of sufficient general interest for publication in the monthly volumes published by the British Medical Association, are yet sufficiently important for a specialist journal. It is to be hoped that our readers will collaborate in the preparation of these abstracts. Those who are willing to take part in the service are invited to communicate with the Editor, The Abstracting Service, B.M.A. House, Tavistock Square, London, W.C.I. There is special need of abstracters in foreign languages, and when offering his or her services the writer should indicate the language (apart from English) in which he or she is proficient. The name of the abstracter will be acknowledged in the text and payment will be made at the rate of ten shillings per abstract for English articles and twelve shillings and sixpence per abstract for articles from foreign languages.

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## ANATOMY.

1786. The Visceral Endopelvic Fascia and the Hypogastric Sheath.

By E. UHLENHUTH, E. C. DAY, R. D. SMITH, and E. B. MIDDLETON. Surg. Gynec. Obstet., 86,

9-28, Jan. 1948. 11 figs., 17 refs.

The authors believe that a detailed knowledge of the visceral endopelvic fascia is valuable because: (1) The fascia provides a sheath or capsule for each of the pelvic viscera. (2) To this sheath are attached the supporting ligaments and other structures. (3) In the substance of this sheath lie the collecting lymph channels from viscera. In the form of perivascular sheaths it serves to fix and to render obvious the position of important vessels and nerves, and to divide the subperitoneal part of the pelvic cavity into distinct fascial compartments.

The authors accept Testut's definition and description of the parietal pelvic fascia but, believing that he overlooked important elements of the visceral fascia, they present a new account of the latter, based almost entirely on the dissection of a single embalmed pelvis of a coloured woman aged 29 years. They recognize the following sub-divisions of the visceral pelvic fascia: (1) the fascial capsules of the pelvic viscera, (2) the fascia endopelvina, (3) the umbilical sheath, (4) the superior haemorrhoidal sheath, (5) the hypogastric sheath, (6) the recto-vesical (recto-vaginal) sheath, and (7) the loose areolar tissue. They claim originality for their descriptions of the hypogastric sheath and of the supporting mechanisms of the uterus, which they believe to be much more complex and important than would appear from former

The hypogastric root arises as two stout membranous layers which, springing from the parietal pelvic fascia, enclose the anterior division of the internal iliac vessels and the ureter. These layers pass forward towards the bladder and split into a superior hypogastric wing, an inferior hypogastric wing, and a presacral wing. The presacral wing passes across the front of the sacrum (splitting to enclose the rectum) and joins its fellow of the opposite side, thus shutting off from the rest of the pelvis a retrorectal space. The superior hypogastric wing splits at the lateral margin of the superior surface of the bladder to clothe the superior and infero-lateral surfaces of this organ. Laterally, it forms a roof for the space of Retzius, carrying the obliterated umbilical and superior vesical arteries in its substance, and extends over the brim of the pelvis to form a sheath for the external iliac vessels. The inferior hypogastric wing, as it extends medially, ventrally, and caudally from the hypogastric sheath, contains the ureter and the inferior vesical vessels. It is attached medially to the dorsolateral border of the bladder and laterally to the fascia endopelvina. This latter forms a horizontal sheet, springing from the fascia covering the upper surface of the levator ani and extending

medially towards the bladder. It is attached to the latter only indirectly, however, through its connexion with the inferior hypogastric wing. It forms the floor of the space of Retzius.

The so-called ligament of Mackenrodt is nothing but this inferior hypogastric wing, and plays no part in the support of the uterus, but is concerned with the fixation of the bladder. The uterus is fixed by the attachment to its cervix of a special slip of levator ani (named by the authors the portio cardinalis of the levator ani), which opposes the tendency of the uterus to exert medial traction on the "ligament of Mackenrodt", and thus on the uterine vessels. If this slip should be damaged the drag of the uterus on the vessels may be sufficient to cause obstruction of the ureter at the point where it is crossed by the vessels, since the ureter is fixed in position by the fascia of the inferior hypogastric wing and cannot yield to the pull of the vessels. It is suggested that the hydronephrosis associated with prolapse of the uterus may be relieved by ligation and division of the uterine vessels, the ovarian vessels then maintaining the blood supply of the uterus.

The rectum and retrorectal space may be easily reached through the space of Retzius without opening the peritoneum. This space is separated from the retrorectal space by thin fascia only, below the level of the inferior vesical artery. H. Hughes

1787. The Rectogenital Septum.

By E. Uhlenhuth, W. M. Wolfe, E. M. Smith, and E. B. Middleton. Surg. Gynec. Obstet., 86,

148-163, Feb. 1948. 14 figs., 7 refs.

The authors, working in the University of Maryland Medical School, Baltimore, demonstrate that the "rectogenital septum", denoting the male rectovesical septum and the female rectovaginal septum collectively, is of pertioneal origin and not a purely fascial structure. Cuneo and Veau in 1899 advanced the view that the prostato-peritoneal fascia was a peritoneal derivative, but in 1922 Wesson claimed that the rectovesical fascia is of fascial nature. Other investigators have failed to demonstrate a septum in the female, stating that the tissue between rectum and vagina is but the fascial capsule of the two organs with "loose areolar tissue between".

The authors' investigations were made on 37 male and female infants, 26 adult male cadavers, and a small number of female cadavers. [Beautiful illustrations of dissections, 5 in the male and 5 in the female, are reproduced.] The dissections offer convincing proof that a peritoneal pouch usually exists in the foetus down to the pelvic floor, and that the walls of the pouch fuse at or near term. Measurements of the distance in adults from the bottom of the rectovesical pouch to the anterior anal commissure showed large variations in both male and female (rectovaginal), being on an average much smaller in the female. In the male the septum was always separated from the rectum

by loose connective tissue and more closely adherent to the bladder and seminal vesicles. In one case it was not found at all, and this was explained by the exceptionally cranial situation of the rectovesical pouch (110 mm. from the ventral commissure of the anus). The surface of the septum was generally firm, glistening, and greenish, whereas adjacent fascial membranes were dull, whitish and felt-like. The configuration of the peritoneum at the caudal end of the pouch where the septum began was often seen as a white scar line. In infants the septum could be split and the pouch "reopened" even to the floor of the pelvis.

[The views expressed and the findings appear to coincide with those of Kirk (*Proc. R. Soc. Med.*, 1947, 40, 876), who stated: "The urorectal septum is at first solid mesoderm but later becomes excavated by an extension into it of the coelomic (peritoneal) cavity. . . . In the male at birth the rectovesical pouch extends to the perineal body. . . . Later . . . (it) is obliterated by adhesions of its walls."]

Elliot E. Philipp.

#### PHYSIOLOGY.

1788. Study of the Temperature of the Cervix Uteri. (Etude sur la température cervico-utérine.)

By A. NETTER. *Presse méd.*, 56, 506-507, July 17, 1948. I fig., I ref.

1789. Inhibitory Action of Homologous Liver Extract on Oestrus in the Rat. (Azione inibitrice dell' estratto epatico omologo sull'estro del ratto.)

By R. CANDIDO and M. GERLI. Arch. Ostet. Ginec., 53, 105-119, Mar.-Apr. 1948. 14 figs., 12 refs.

These investigations, carried out at the Obstetrical and Gynaecological Clinic of the University of Naples, are based on a theory propounded by Zondek in 1934 that folliculin may be metabolized by the liver, and on experiments by various authors which showed that natural and synthetic oestrogens are inactivated by liver extracts in vitro.

Varying amounts of watery extracts from livers of mature rats were injected into 27 female rats whose sexual cycle had previously been typed by examination of their vaginal smears. Daily injections of 2 ml. of the extract for 10 consecutive days resulted, in the majority of animals so treated, in persistence of di-oestrus with suppression of the oestrus cycle. Smaller doses caused prolongation of di-oestrus only or no modification of the cycle. Histologically intense and widespread luteinization with extreme scarcity or complete absence of developing follicles was constantly demonstrated in the ovaries. The vagina was in quiescent state; the uterine cornua were small and atrophic. The hypophysis and the liver were practically unchanged.

The authors offer two possible explanations for these phenomena. Either the liver extracts contained a luteinizing factor and the massive luteinization of the ovaries arrested ripening of follicles and therefore the vaginal cycle, or the extracts neutralized or inactivated the natural oestrogens, causing hypofolliculinaemia and, through the action of the hypophysis, overproduction of luteinizing, and relative underproduction of follicle-stimulating, gonadotrophin and thus suppression of the oestrous cycle.

N. Alders

1790. Studies on the Human Corpus Luteum. Histologic Variations in Corpora Lutea and in Corpus Luteum—Endometrial Relationships at the Onset of Normal Menstruation.

By J. I. Brewer and H. O. Jones. Amer. J. Obstet. Gynec., 54, 561-575, Oct. 1947. 12 figs., 5 refs.

A study was made of the variations in the life cycle of the human corpus luteum, the endometrial cycle, and the relation between the two. The material on which the study was based consisted of 10 uteri, each together with a corpus luteum, removed from patients aged 23 to 47. Seven of the uteri were removed on the first day of menstruation and 2 before the onset of menstruction. The menstrual cycle had been normal in each case. Degeneration of the granulosa lutein cells first takes place some 4 to 6 days before the onset of menstruation. The degeneration is slowly progressive and can be reversed by the onset of pregnancy. It may involve all the cells or only local groups, and occasionally may be almost absent at the onset of menstruation. In view of these differences it was concluded that there are considerable variations in the granulosa lutein cells before and immediately after the onset of menstruation. Similarly, in the study of the endometrial patterns it was observed that considerable variations occurred which could not be correlated with the histological activity of the corpus luteum. In one specimen, in spite of an apparently normal corpus luteum, the endometrium showed the changes that are characteristic of anovulatory menstruation.

From these findings the authors concluded that study of endometrial specimens removed at or near the time of menstruation may lead to an erroneous interpretation of corpus luteum activity.

J. Stallworthy

1791. Serum Iron in Normal Women.

By S. Dahl. Brit. med. J., 1, 731-733, Apr.

17, 1948. 1 fig., 10 refs.

Serum iron values in healthy women ranged from 68 to 194 µg., most lying between 70 and 140 µg. per 100 ml. The concentration was lower in menstruating women than in those not menstruating.

Douglas H. Collins

1792. The First Menstrual Period After Labour and Abortion. (Erste Menstruation nach Partus und Abortus.)

By P. ELSNER. Wien. klin. Wschr., 60, 433-435, July 9, 1948. 2 figs., 18 refs.

1793. "Substance P" in Menstruation. (A proposito della S.P. nella mestruazione.)

By M. Bertani. Monit. ostet.-gynec., 19, 92-102, Mar.-Apr., 1948. 36 refs.

1794. A Comparative Study of Vaginal and Cervical Cornification in Human Subjects.

By J. E. AYRE, P. M. CHEVALIER, and W. B. AYRE. J. clin. Endocrinol., 7, 749-752, Nov. 1947. 1 fig., 5 refs.

Cervical and vaginal smears covering all stages of the menstrual cycle in 125 patients with a wide range of ages were compared as regards the amount of cornification. Cervical smears were taken by means of a special speculum, the scraping being taken from the squamous margin of the squamocolumnar junction. The vaginal smears were taken by light scraping of the lateral wall of the vagina. The smears were stained with Papanicolaou's polychrome stain. The level of cornification was estimated by counting the number of cornified cells, large flat epithelial cells with pyknotic nuclei and acidophilic cytoplasm, per 100 squamous epithelial cells. Pseudocornified cells having acidophilic cytoplasm but no nuclear pyknosis were not included.

The cornification level in both smears varied with the phase of the cycle, rising gradually during the follicular phase to a peak (over 50 per cent) at ovulation and falling irregularly to a level approaching zero just before menstruation. After either administration or injection of oestrogen in castrated or menopausal women, the level rises from zero to that found in the normal cycle, the rise appearing a few days after starting treatment and being proportional to the administered dose. [No figures given.] The time interval is shorter when oestrogen is given in vaginal suppositories. In 88.8 per cent of the cases the count of cornified cells was higher in cervical than in vaginal smears, the difference varying from 5 to 55 per cent. In 7.2 per cent levels were equal and only in 4 per cent was the count higher in vaginal than in cervical smears, the difference varying from 5 to 10 per The reasons for this difference are discussed; it may be due to a greater sensitivity of the cervical epithelium to oestrogen, or to a higher concentration of oestrogen in the cervix, or to a combined S. A. Simpson effect of both these factors.

1795. Cytological Cycle of the Urinary Sediment and its Parallelism with the Vaginal Cycle.

By E. B. Del Castillo, J. Argonz, and C. G. Mainini. J. clin. Endocrinol., 8, 76-87, Jan. 1948. 16 figs., 8 refs.

Smears of cells found in urine are made by rubbing with a wire loop the inner surface of a filter paper after most of the first morning specimen has filtered through it. The moist smear is immediately fixed in alcohol-ether and stained for 3 minutes (Schorr, Science, 1941, 94, 545.) To prove that cells

found in the urine were not extraneous, a catheter was introduced for not more than 1 cm. into the nrethra for direct sampling of the urethral contents. After studying a group of cases, which included a normal prepuberal girl, normal adult women, menopausal women, patients with primary amenorrhoea and under oestrogen therapy, by both the urinary-cell and the vaginal-smear method, the authors maintain that there is close correlation in the morphology of the cells obtained from each source.

Magnus Haines

1796. A Comparison of Oral and Vaginal Epithelial Smears.

By D. E. ZISKIN and R. MOULTON. J. clin. Endocrinol., 8, 146-165, Feb. 1948. 25 figs., 19 refs.

The work of Papanicolaou showed that it is possible to follow cyclical hormonal changes in the human female by daily observation of vaginal smears. An attempt is made in this article to correlate changes in the oral mucosa with those occurring in the vagina, in order to develop a simpler technique for following endocrine changes. In experiments on rhesus monkeys, administration of oestrogen was found to produce gingival hypertrophy and hyperkeratinization of the oral mucous membrane, whatever the endocrine status of the animal (normal, castrated, immature, or hypophysectomized); atrophy of the mucous membrane and reduction in the layer of keratin was brought about by castration or hypophysectomy. In the presence of chorionic gonadotrophin or progesterone, keratinization was greatly diminished. Similar changes were found in the oral mucous membrane of human subjects suffering from endocrine disturbances or receiving oestrogen therapy. For instance, in a child of 7 with adrenal hyperplasia and pseudohermaphroditism normal keratinization was absent while hyperkeratinization was found in those receiving oestrogen therapy and also in a patient suffering from Addison's disease.

Oral and vaginal smears were taken simultaneously from 23 women, some normal and and some suffering from mild endocrine disturbances. From a comparative study of these smears it is concluded that although the oral and vaginal epithelium undergo parallel changes in degree of cornification during the menstrual cycle and under oestrogen therapy, slight hormonal changes are more easily recognized in the vaginal smear; the latter affords a better indication of the time of ovulation, so that in spite of its technical advantages the oral smear cannot replace the vaginal smear in hormone study.

Margaret Puxon

1797. Simple Approach to the Study of Vaginal Smears: I. Variations in the Normal Sexual Cycle.

By R. G. Bonime. Amer. Practit., Phila., 2, 664-670, June 1948. 10 figs., 7 refs.

1798. Rapid Determination of Urinary Pregnanediol. Method Suitable for Routine Clinical Use.

By I. F. Sommerville, G. F. Marrian, and R. J. Kellar. Lancet, 2, 89-90, July 17, 1948. 13 refs.

1799. Oestrogens and Temperature Regulation. (Oestrogènes et régulation thermique.)

By M. Albeaux-Fernet, E. Housset, and -BOULET-GERCOURT. Ann. Endocrinol., Paris, 9, 131-135, 1948. I fig., 4 refs.

1800. Metabolism of the Steroid Hormones-The Metabolism of Progesterone and Ethinyl Testosterone. By R. I. Dorfman, E. Ross, and R. A. Shipley.

Endocrinology, 42, 77-80, Feb. 1948. 9 refs. It has not been possible to demonstrate the conversion of ethinyl testosterone to pregnanediol-3 (a), 20 (a), or any other steroid either in men or in women suffering from secondary amenorrhoea when daily oral doses of 300 mg. of the steroid were administered. Progesterone absorption from the gastro-intestinal tract was demonstrated by the isolation of sodium pregnanediol glucuronide after the administration of the progestational hormone. However, it was shown that the preganediol complex isolated by the Venning procedure contained a small amount of pregnanol-3 (a)-one-20 in addition to pregnanediol-3 (a), 20 (a). Thus it appears that pregnanol-3 (a)-one-20 can be classed as a metabolite of progesterone along with pregnanediol-3 (a), 20 (a).—[Authors' summary.]

1801. The Effects of Progesterone, Oestradiol, Thyroid Hormone, and Androsterone on the Artificial Premature "Climacteric" of Pure Gonadal Origin Produced by Ovariectomy in Rats.

By V. Korenchevsky and V. E. Jones. J. Gerontol., 3, 21–39, Jan. 1948. 26 figs., 26 refs.

This is the fourth article of a series dealing with the action of female sex hormones. The work was done in the Gerontological Research Unit, Oxford, 78 ovariectomized rats being used for 3 experiments (14 as controls, 64 receiving hormones). methods of administration and of estimation of results have been described in previous papers. importance was attached to the relative weights of organs per unit of fat-free body weight.

This work confirmed previous findings in many respects. There was slight gain in body weight and fat deposition after androsterone, and a decrease after thyroid and oestradiol, the depressing effect of which was not counteracted by androsterone and progesterone. It appears that for the greatest development of progestational changes in the uterus all four hormones are necessary. In contrast to uterine changes, in the vagina the greatest degree of mucification was observed in rats injected only with progesterone and oestradiol. The liver increased significantly in weight only after the simultaneous use of thyroid and oestradiol benzyl benzoate, while the simultaneous administration of all four hormones caused liver hypertrophy without much change in structure. In the case of the thyroid gland, the depressing effect of thyroid hormone outweighs the stimulating effect of a combination of androsterone and progesterone. Preputial glands hypertrophied only after andro-

The authors discuss the effects of oestrogens on the hypophysis in great detail, and review the work of others in this field. The present experiments emphasize the neutralizing effect of androsterone on oestrogenic hypertrophy of this organ, and also its involutionary effect on the thymus. The thyroid hormone was shown to be the main factor responsible for splenic hypertrophy; thyroid and androsterone caused cardiac hypertrophy.

Morag L. Insley

### PREGNANCY.

1802. Young and Elderly Primiparae. (Primiparas jovens e primiparas idosas.)

By A. Novis. Rev. brasil. Cir., 17, 65-70, May 1948. 8 refs.

1803. Can Menstruation Persist during Pregnancy? (La menstruation peut-elle persister au cours de la grossesse?)

By P. Magnin and A. Burnon. Rev. franç. Gynéc., 43, 235-248, June 1948. 34 refs.

1804. A New Apparatus for Radiological Pelvimetry. (Un nouvel appareil de radiopelvimétrie.)

By —. Trillat and —. Magnin. Gynéc, et

Obstet., 47, 193-203, 1948. 5 figs.

The authors have applied to the Fabre method of radiopelvimetry the superimpression technique advocated by Thoms and Turpin in the U.S.A. With the American apparatus films are exposed with the patient in a half-sitting position, so that the inlet plane is parallel to the film on which the patient sits. The X-ray tube is centred at right angles to the inlet plane. After a first exposure, the patient is removed, tube and film remaining in place; the patient's place is taken by a leaden screen perforated by holes r cm. apart, and the film is again exposed. The present authors expose films with the patient lying on her abdomen, a position which, according to Portes and Blanche, is well tolerated by pregnant women This position gives maximum visibility of the promontory and an excellent picture of the foetal head. The plane of the innominate lines ("transverse-pubic plane"), corresponding to the major part of the inlet plane, passing through the superior fourth of the pubis and the lateral dimples of Michaelis's lozenge, is marked by means of two lateral rulers, one on each side of the patient; the X-ray tube is above and behind the sacral region. The patient's place is afterwards taken by a metallic screen with punctate perforations 1 cm. apart which slides between the

fixed rulers. By this method the transverse diameter is measured exactly, but there are variations in the antero-posterior diameter, since the promontory overlaps the innominate lines.

The new method permits a double superimpression. The first superimpression is in the plane of the innominate lines, the transverso-pubic plane; the second superimpression is in the promonto-pubic plane, the other end of the same metallic screen being used. To avoid confusion with the first superimpression picture, this end has linear perforations.

After a technical description of the construction of the apparatus (mainly a swivelling ruler-frame for the metallic screen), the authors recapitulate the four main stages in the technique: (1) Markings are made on the patient at the union of the superior fourth and inferior three-fourths of the pubis, at the lateral dimples of Michaelis's lozenge, and above the spine of the fourth lumbar vertebra. (2) The patient lies on her abdomen between the two rulers of the mobile frame, and the angulation is noted when the frame inclination corresponds to the two pelvic planes under consideration. The first exposure is made. (3) The first superimpression picture is taken. (4) The second superimpression picture is taken, the end of the screen with linear perforations being placed in the inclination corresponding to the promonto-pubic plane. The linear markings on the film give the antero-posterior diameter, the punctate markings the transverse

[The posterior marking of the promonto-pubic plane (L4) is variable, but even a 2-cm. error will not result in an error greater than 2 mm. in the estimated antero-posterior diameter. It may prove difficult to assess correctly the contour of the promontory on these films, especially with foetal head interposition. An advantage of the method, mainly an advantage of the ventral position, is that the possible adaptation of the foetal head to the pelvic inlet is shown.]

H. Godar

1805. Radiological Pelvimetry with the Pelvic Inlet not Parallel to the Plate. (Die rontgenologische Grössenbestimmung der Beckendurchmesser bei nicht platten-paralleler Beckeneingangsebene.)

By L. PREISSL. Klin. Med., Wien, 3, 543-554, July 15, 1948. 6 figs.

1806. A Simplified Method of Roentgen Pelvicephalometry.

By A. K. Wilson. Amer. J. Roentgenol., 59, 688-698, May 1948. 5 figs., 4 refs.

1807. Relaxin Content of Blood, Urine and Other Tissues of Pregnant and Postpartum Guinea Pigs.

By M. X. ZARROW. Proc. Soc. exp. Biol., N.Y.,

66, 488-491, Nov. 1947. 1 fig., 9 refs.

Relaxin, first detected in the blood of pregnant rabbits and guinea-pigs and later in other mammals, may be assayed by its effect of pubic-bone separation.

Blood samples, obtained by cardiac puncture from guinea-pigs weighing 600 to 800 g. with dated pregnancies, were pooled in groups according to the duration of pregnancy. By pooling, a sufficient quantity was obtained for the determinations. Urine samples were collected for the 24 hours before the blood collection and dialyzed against running tap water. Placentae and uteri, obtained on the 56th and 63rd days of pregnancy, were ground up and extracted twice with 3 per cent hydrochloric acid. These extracts, kept at pH o.5 in the cold, were adjusted to pH 7.0 with 10 per cent sodium hydroxide before injection. Groups of guinea-pigs were studied at 15, 21, 28, 35, 42, 49, 56, and 63 days after mating (57 in all) and at 2, 6, 24, and 48 hours postpartum (23 in all). Urine samples were collected 42, 56, and 63 days after the animals had been mated. Test animals were given o.1 g. oestradiol daily for 3 days before use. For each sample a concentration was obtained which gave 67 per cent response. The method of assay was that of Abramowitz et al. (Endocrinology, 1944, *34,* 103.)

Relaxation of the symphysis pubis began from the 18th to the 25th day in a series of 20 guineapigs. This corresponds with the appearance of relaxin (up to 0.5 guinea-pig units per ml. of serum) in the blood of pregnant guinea-pigs. The highest level, which is maintained for about 4 weeks, begins to fall before parturition (it was 0.33 units on the 63rd day after mating). It is suggested that a similar ante-partum fall in the relaxin levels occurs in women. Other findings suggest that the fall in relaxin levels in serum and urine may be due to a decreased output by the placenta.

Magnus Haines

1808. The Role of the Steroid Hormones in the Relaxation of the Symphysis Pubis of the Guinea Pig. By M. X. ZARROW. Endocrinology, 42, 129-140,

Feb. 1948. 1 fig., 41 refs.

Relaxation of the symphysis pubis of the guineapig may be produced by treatment with: (a) oestradiol, (b) oestradiol and progesterone, and (c) oestradiol and relaxin. In the castrated, hysterectomized guinea-pig progesterone is without effect, whereas in the presence of a uterus treatment with oestradiol and progesterone both shortens the time required for pelvic separation as compared with oestradiol treatment alone and results in the formation of endogenous relaxin. Relaxin is effective in both castrated and castrated hysterectomized guinea-pigs which have been pretreated with oestradiol, and produces relaxation in 6 hours. This is a much shorter time than that following treatment with oestradiol alone or oestradiol and progesterone. It is concluded that relaxation of the symphysis pubis of the guinea-pig may take place by means of two different procedures: (1) prolonged treatment with oestradiol which apparently has a direct affect on the symphysis and (2) treatment

-with relaxin—exogenous relaxin may be injected into an oestrogen-primed guinea-pig or endogenous relaxin may be formed after treatment with oestradiol and progesterone in the presence of a uterus.

It is noted that optimum relaxation with the steroids is obtained when progesterone and oestradiol are given simultaneously. Desoxycorticosterone acetate is approximately one tenth as active as progesterone in its ability to produce the formation of relaxin and pubic relaxation.—[Author's summary.]

1809. Relationship between Erythrocyte Sedimentation Rate, Sludged Blood, and Plasma Proteins during Pregnancy.

By L. D. Odell, G. T. Aragon, and R. E. Pottinger. Amer. J. Obstet. Gynec., 54, 596-610,

Oct. 1947. 4 figs., 26 refs.

The authors apply the term "sludged blood" to blood in which microscopic agglutination occurs within venules and arterioles, with the resultant formation of intravascular cell masses. Reference is made to the work of Knisely and his co-workers who had investigated intravascular changes under normal, experimental, and pathological states. Fifty-two pregnant and non-pregnant women were selected for study. Of these 44 were pregnant and 8 were not. Of the pregnancies 21 were normal and 23 were complicated. Sixteen patients had toxaemia and 4 thrombophlebitis; 2 were suffering from acute haemorrhagic shock, and I had an extrauterine pregnancy. The lateral bulbar conjunctival vessels were studied by means of a Leitz dissecting microscope mounted on a colposcope stand. The size of intravascular masses and the degree of reduction of rate of flow were evaluated in fine, medium, and large venules and arterioles and from these observations an estimate was made of the erythrocyte sedimentation rate. As a check on the estimates venous blood was taken and the sedimentation rate was read in a Wintrobe tube with heparinized blood. The cell volume, fibringen content, total serum protein, and albumin: globin ratio were also estimated.

The result showed that the degree of "sludge" appeared to be proportional to the sedimentation rate. It was detected readily in fine venules, giving rise to the appearance of a string of beads, in the medium-sized venules with a granular appearance, and least readily in the large venules, where larger clumps were visible. "Sludge" was not observed in arterioles during normal pregnancy. The largest cell masses, and the greatest reduction in rates of flow, were seen in patients near term, in labour, or early in the puerperium. In 6 normal pregnant patients with sedimentation rates below 24 mm. per hour, no intravascular agglutination was detected. In two non-pregnant controls, with high sedimentation rates associated in one case with pelvic inflammatory disease and in the other with

carcinomatosis, there was "sludging" in both venules and arterioles. In normal pregnancy all patients with a sedimentation rate of 33 mm. per hour or more were found to have "sludged blood". In pregnancy toxaemia arteriolar narrowing was detected in most patients and intravascular agglutination with reduced rate of flow was observed. "Sludge" was more pronounced than in normal pregnancy. Similarly in the cases of thrombophlebitis intravascular agglutination was marked, as it was in 3 instances of haemorrhage shock. In one case no "sludge" was detected in a patient with a low sedimentation rate, in spite of the diagnosis of acute inflammatory pelvic disease. Operation revealed the presence of an ectopic -J. Stallworthy pregnancy.

1810. Serum Precipitable Iodine Concentrations during Pregnancy.

By M. Heinemann, C. E. Johnson, E. B. Man. *J. clin. Invest.*, 27, 91–97, Jan. 1948. 4 figs., 23 refs.

"Circulating thyroid hormone is measured more accurately by determination of serum precipitable iodine than of basal metabolic rate. Since the latter increases during pregnancy serum precipitable iodines were investigated in 43 pregnant women and followed in some subjects after delivery." Of the subjects 29 were normal. Two of these were given 15 drops daily of Lugol's solution for 5 and 9 weeks respectively. "One subject received 100,000 units of oestradiol in oil intramuscularly within I week. Of the remaining 14 women, 4 had hyperthyroidism, 4 miscarried, and 6 who did not miscarry were given desiccated thyroid, although the diagnosis of hypothyroidism could be made in only 1. The serum proteins were precipitated with zinc sulphate and sodium hydroxide, and the iodine included with the precipitated proteins was measured by the Riggs and Man permanganate acid ashing method. With this method the range of concentrations in normal humans is 4 to 8 µg. per cent with a mean value of  $5.6 \pm 1.3 \mu g$ . per cent."

In the 29 normal pregnant women the concentrations of serum-precipitable iodine ranged from 6.2 to 11.2 μg. per 100 ml., a rise in value being noted as early as 3 and 6 weeks after conception. The concentrations did not increase during the subsequent course of pregnancy, and soon returned to normal after delivery. In 10 cases women, in whom abortion threatened or had occurred, had serumprecipitable iodine values low for normal pregnancy. One patient taking gr. 3 (0.2 g.) of desiccated thyroid daily miscarried when the serum-precipitable iodine value was 7.3  $\mu$ g. and aborted a second time when she was not taking thyroid and her iodine value was as low as 2.8  $\mu$ g. per 100 ml. In 3 pregnant women with hyperthyroidism, concentrations of serum-precipitable iodine were higher than in normal pregnant subjects. These women

were treated with thiourea and Lugol's solution, and were delivered of apparently normal babies at term. There was I case of hypothyroidism, the patient taking gr. 11/2 (0.1 g.) of desiccated thyroid daily in the third month. In the fourth month there was a threatened abortion and at this time the serum-precipitable iodine value was found to be 6.6  $\mu$ g. per 100 ml. She was given 2 mg. of thyroxine intravenously on 2 successive days, and the oral dose of thyroid was increased. After the effect of intravenous thyroxine had subsided the serum-precipitable iodine values were 10 and 7.8 μg. per 100 ml. She was delivered of a normal baby at term. The authors consider that there may be a place for thyroid therapy in pregnancy when the serum-precipitable iodine values are low, and that such treatment may prevent abortion, although the observations they quote in this paper are statistically insignificant. R. B. Lucas

1811. The Histaminolytic Action of Blood during Pregnancy.

By G. V. ANREP, G. S. BARSOUM, and A. Івканім. J. Physiol., 106, 379-393, Oct. 15, 1947.

4 figs., 12 refs.

The authors describe a simplified and rapid method for estimating the histaminolytic index (HI) of blood—that is, the percentage of histamine diphosphate destroyed in 30 minutes at 37° C. the initial concentration being 3  $\mu$ g. per ml. Negative findings are reported in 150 tests for histaminolysis in normal human blood, plasma, or serum. Similar results were obtained with the blood of patients with tuberculosis, cancer, allergy, and heart failure, and in various febrile states. In the blood and serum of dogs, cats, rats, and horses there was no histaminolysis, and in those of pigs, camels, sheep, and rabbits indices ranged from 15 to 30 per cent. Subcutaneous injections of histamine in dogs and human subjects did not stimulate histaminolysis. The HI was determined in 136 cases of normal pregnancy. Histaminolysis is apparent in the third month of pregnancy and increases steadily to a maximum at term. The HI rapidly declines in 48 hours after delivery to less than a quarter of the observed maximum. The low HI of foetal blood indicates that this is not the source of the high HI of the mother's blood. Extracts of placenta had a histaminolytic action 10 to 15 times greater than that of serum, and the evidence points to the placenta as the source of the histaminolytic agent. The placentae of the dog, water buffalo, cow, horse, and pig had no histaminolytic action. Histaminolysis was found in the placenta of the rat, although rat blood in pregnancy has little or no histaminolytic power. There is no marked difference between the histaminolytic power of human placental extracts obtained at early or late stages of pregnancy.

E. F. McCarthy

1812. Function of Hyaluronidase in Fertilization. By C. R. Austi. Nature, Lond., 162, 63-64, July 10, 1948. 6 refs.

1813. The Time of Conception. Is Knaus or Stieve Correct? (Zur Frage der Empfangniszeit der Frau: Hat Knaus oder Stieve recht?)

By G. Linzenmeier. Zbl. Gynäk., 69, 1108-1110,

1947. 2 figs.

The author states that he has had a unique opportunity of studying the question whether conception can only take place during a period of a few days near the date of ovulation (Knaus) or on any day between two menstrual periods (Stieve, Caffier, and others). Many cases of rape are reported to have occurred in Karlsruhe when the town was occupied in April, 1945. The women were in a position to fix with accuracy the day, and frequently the hour, of cohabitation. Hundreds of women consulted the medical officers at the

Karlsrulie Women's Hospital.

Permission having been given by the authorities to terminate pregnancies in such cases, after strict investigation and the hearing of witnesses, the author selected 67 "reliable" cases in which it was possible to ascertain with accuracy the date of cohabitation and the menstrual history of the last 6 months. He found that in no case had conception taken place during the premenstrual phase. Out of the 48 women with a history of regular 4weekly periods, 23 had conceived during the postmenstrumm and 25 during the intermenstruum. Nineteen women menstruated irregularly and of these 2 had conceived at the beginning of the premenstruum, 14 during the intermenstruum, and 3 in the postmenstruum. As controls 90 women were investigated who did not conceive as the result of forced cohabitation. In all these cases, intercourse had taken place either during the postmenstruum or during the premenstruum, never during the optimal period.

The author concludes that the probability of conception is only slightly less during the first 10 days of the cycle than between the 11th and 18th days of a 28-day cycle. Conception does not take place during the premenstruum but may occur on any other day of the cycle, with greatest facility during the well-known optimal period. Conception occurring during the postmenstruum is best explained by Caffier's theory of "provoked" ovula-N. Alders

tion.

1814. The Human Conceptus during the First Two Weeks of Gestation.

By J. Rock and A. T. Herrig. Amer. J. Obstet. Gynec., 55, 6-17, Jan. 1948. 3 figs., 10 refs.

Early embryos were obtained from material removed at operation (26 specimens from 122 uter removed from fertile women, 104 of whom had ovulated and had been exposed to the possibility of conception) and 4 ova were fertilized in vitro

by sperms. The fertilized ova could be "cultured" to the 2-cell or 3-cell stage. The earliest of the specimens obtained at operation corresponded to to a "7-day-old" gestation. Of the operation specimens 47 per cent were abnormal [an interesting point for a discussion on the relative importance of environment versus genetic factors]. The authors consider that the ovum may reach the uterus by the third day. As judged from what is known about monkeys, a blastocyst is present by the 6th day with three differentiated tissues beginning to embed in the endometrium. By 10 days the ovum is interstitial in the endometrium and has a diameter of 0.5 mm., and the amnion is formed. By 12 days the ovum is 1 mm. in size and the embryo itself about o.1 mm.. By .14 days the mesoblast is extending and the maternal blood filling the lacunar spaces. At 16 days branched villi of a mature type have appeared.

[The work of these authors is so important and well known that this paper must be read fully.]

Kenneth Bowes

1815. Foetal Death with Increased Length of Pregnancy. (Fruchttod bei verlangerter Tragzeit.)

By K. Solth. Geburtsh. u. Frauenheilk., 8,

188-197, Jan. 1948. 4 figs., 11 refs.

An investigation was made of the foetal deaths which occurred between 1901 and 1945 in the University Clinic, Marburg. There were 15,686 births of which 585 were stillbirths. The author was particularly interested in the connexion between the duration of pregnancy and the foetal mortality. The length of gestation was estimated from the first day of the last menstrual period. A pregnancy was considered to be prolonged when it exceeded 290 days; there were 3,358 cases (22.48 per cent) in this series. The foetal mortality with varying lengths of pregnancy was: 18.88 per cent for 220 to 239 days; 8.85 per cent for 240 to 259; 3.09 per cent for 266 to 279; 2.68 per cent for 280 to 299; 6.13 per cent for 300 to 319; and 9.92 per cent for 320 to 339 days. These figures show that the mortality rate is high among the premature infants and also in those postmature after the 200th day. The author investigated the weight and length of the postmature babies, and found that 70 per cent were of normal weight and size. The highest death rate was in the remaining 30 per cent-that is, in infants larger or smaller than normal. When the foetus weighed between 4,500 and 5,000 g. the foetal mortality was 6.12 per cent; when the weight was between 5,500 and 6,000 g. it was 50 per cent. When the foetus weighed less than 2,000 g. the mortality was 60 per cent; when less than 2,500 g. it was 20 per cent. The author concluded that the high foetal mortality in prolonged pregnancy was due to the relatively high proportion of overdeveloped and underdeveloped foetuses. ,

Gladys Dodds

1816. Postmaturity.

By L. A. Calkins. Amer. J. Obstet. Gynec., 56, 167-172, July 1948. 2 figs.

1817. Hormone Secretion by Human Placenta Grown in Tissue Culture.

By .H. L. STEWART, M. E. SANO, and T. L.-Montgomery. J. clin. Endocrinol., 8, 175-188,

Feb. 1948. 8 figs., 11 refs.

Since the observations that the blood and urine of pregnant women contain large amounts of gonadotrophins and oestrogens, and that placental extracts also contain these hormones, the placenta has been regarded as an organ of internal secretion. Recent work on tissue culture has supported this view, and this paper is a further contribution to the evidence that the placenta is the organ, responsible for secreting the hormones of pregnancy. Placental fragments for tissue culture were obtained during operations for termination of pregnancy. The tissue was examined histologically and cultured, and the hormones secreted in culture were assayed biologically. The preoperative levels of serum gonadotrophin and oestrogen were also recorded in each case. From this work [4 cases are described in detail, but it is clear that many others were studied] the authors draw the following conclusions: (1) Three types of cell can be grown from placental tissue-stromal, syncytial, and Langhans cells—but after a few days the Langhans cells predominate, the syncytial cells growing very slightly and eventually disappearing altogether. (2) Gonadotrophic hormone is produced by tissue cultures of 3-month-old human placentae. (3) The amount of gonadotrophin secreted is directly related to the growth of Langhans cells. (4) Evidence of oestrogen production is inconclusive; the blood level of oestrogen is highest just before delivery, but it was found impossible to grow tissue cultures from placentae of 8 and 9 months, as the fibrous stroma grew rapidly and inhibited the growth of the other cell types, which presumably are responsible for hormone production. (5) Control tissue cultures of fibroblasts do not secrete hormones.

[A detailed description is given of the methods of tissue culture and hormone assay employed, and the article is accompanied by a series of excellent photomicrographs.]

Margaret Puxon

1818. Enhancement of Effect of Chorionic Gonadotrophin on Ovarian Hyperemia in the Rat by Pituitary Extract.

By A. E. RAKOFF and P. H. FRIED. Proc. Soc. exp. Biol., N.Y., 66, 491-492, Nov. 1947. 16 refs. Intraperitoneal injections of chorionic gonadotrophins, pituitary "synergist", or a mixture of both were given to 307 albino rats, 28 to 32 days old. The unit of "synergist" prepared from characteristics.

old. The unit of "synergist", prepared from sheep pituitary, was defined as that amount which, when combined with 15 i.u. chorionic gonadotrophin,

will cause a five-fold increase in ovarian weight over that of uninjected controls. The rats after 1 hour and 1½ and 2 hours were asphyxiated with ether and the ovaries were examined for hyperaemia. Technical details are given by Kupperman and Greenblatt (Sth. med. J., 1946, 39, 158). The authors maintain that the addition of small amounts (0.044 unit) of "synergist" enhances the value of the rat test for pregnancy. Magnus Haines

1819. The Guterman Reaction in Clinical Practice. By E. M. A. DAY and L. J. CAINS. Med. J. Aust., 1, 199-201, Feb. 14, 1948. 4 refs.

The authors have investigated a series of cases to determine whether the Guterman test for urinary pregnanediol is reliable enough for use as an aid in the diagnosis of pregnancy. All reagents were carefully purified, as previous results had shown that impurities, especially in the sulphuric acid,

were a potent source of error.

One series of 18 specimens of urine submitted for the Friedman test were also examined for the Guterman reaction. With the Friedman test there were 9 positive reactions, 8 negative reactions, and 1 doubtful reaction. With the Guterman test there were 15 positive and 3 negative reactions. In all these cases subsequent events proved the Friedman reaction to be the correct one. Of 13 normal pregnant women attending the antenatal clinic, only 10 gave a positive Guterman reaction. In a variety of other conditions, including foetal death and hydatidiform mole, the rate of error with this test was high. In all, "the total error in the series was 36 to 27 per cent 'false positive' reactions and 9 per cent 'false negative' reactions". As 8 positive results were given by urine from men, it is suggested that the test may be non-specific.

Doreen Daley

1820. A Chemical Test for Pregnancy: Estimation of Pregnanediol Glycuronate. (Un test chimique de la grossesse: Le dosage du glycuronate de prégnandiol.)

By R. Rivoire and G. Bueil. Sem. Hôp. Paris, 24, 1634-1636, July 2, 1948. 8 refs.

1821. The Male Frog, Rana pipiens, as a New Test Animal for Early Pregnancy.

By P. B. WILTBERGER and D. F. MILLER.

Science, 107, 198, Feb. 20, 1948. 2 refs.

This test for pregnancy is carried out by injecting 5 ml. of morning urine into the lymph-sac of each of two male frogs, which are then placed in individual clean jars. A positive response is indicated by the presence of sperm in the urine, which 4 hours after the injection is examined microscopically in two portions, that voided in the interval and the portion in the bladder (and voided on disturbance of the frog). No false results were given in 200 tests on urine from men, non-pregnant women, and women during the first three months of pregnancy. False-negative results may be ob-

tained in tests of urine from women later in pregnancy. The frogs may be used again after 4 to 5 days.

Peter C. Williams

1822. Protein—its Importance in Nutrition of Pregnancy.

By C. H. Boso. West Virginia med. J., 44, 213-217, Aug. 1948. 20 refs.

1823. Eclampsia.

By R. E. JONES. J. med. Ass., Georgia, 37, 207-212, June 1948.

1824. Eclamptic Toxaemia.

By D. N. HENDERSON, Bull. Vancouver med. Ass., 24, 261-267, May 1948.

1825. Influence on the Infant of Toxaemias of Pregnancy. (Uber den Einfluss der Graviditätstoxikose beim Kind.)

By W. Neuweiler. Gynaecologia, Basel, 125,

24-29, Jan.-Feb. 1948. 5 figs.

The author reviews the effects of toxaemia of pregnancy on the foctus in 400 cases seen at the

TABLE I.

Duration of Pregnancy and Stillbirths,

Neonatal Deaths

D	" Toxi	c '' Cases	"Normal" Mothers		
Duration of Pregnancy	Still- Neonatal births Deaths		Still- Neonata births Deaths		
40 weeks 32 to 36 weeks 28 to 32 weeks	(%) 5.4 25.0 Total	(%) 4.8 10.5 188.7%	(%) o.6 7.6	(%) 0.5 9.2	

TABLE II.

Grade of Toxacmia and Stillbirths,

Neonatal Deaths

Grade of Toxaemia	Stillbirths	Neonatal Deàths
Albuminuria Pre-eclamptic toxaemia Eclampsia	(%) 2.22 1.96 10.64	(%) 2.22 11.76 7.45

TABLE III.

Method of Delivery

Method of Delivery	"Normal" Mothers	" Toxic " Cases
Normal Extraction Caesarean section Forceps Perforation	(%) 91 4 2.5 2 0.5	(%) 65 1.5 28 5 0.5

University Clinic, Berne, over a period of 25 years. He classifies toxaemia into: albuminuria of pregnancy, severe pre-eclamptic toxaemia, and eclampsia. All the findings can be given in the simplified tables above.

"Toxaemia" developed in 0.4 per cent of all pregnant women between 1917 and 1924 and in 1.3 per cent between 1925 and 1940. The figure now stands at about 0.9 per cent. The children of "toxic" mothers tend to be not only lighter Elliot E. Philipp but also shorter at birth.

1826. A Nine-year Follow-up in Cases of Toxemia of Pregnancy.

By F. P. LIGHT. Amer. J. Obstet. Gynec., 55,

321-325, Feb. 1948. 3 figs., 10 refs.

Since 1937 patients treated for toxaemia of pregnancy at the Long Island College Hospital have attended a follow-up clinic. Of 530 toxaemic patients 391 were followed up; there were 968 pregnancies among these 391 patients, 685 of which were associated with toxaemia or vascular renal\_ disease; the remaining 283 were normal. Only 13 of the patients had eclampsia. The duration of the toxaemia and the influence of toxaemia on permanent renal damage were studied.

The patients were divided into five groups—those who had severe toxaemia for I week, 2, 3, 4, or over 4 weeks respectively. There was no significan difference between the groups. In some 30 per cent there was permanent damage; for the most part the evidence for this was an elevated blood pressure. The cases were also grouped according to the patient's age at the time of the onset of toxaemia. The table shows a definite relation between the age of the patient at the time of the toxaemia and the incidence of the residual damage. Late damage increased progressively with age.

Age	18 to 20	21 to 25	26 to 30	_	Over 35
Total cases Residual damage Percentage of	61 9	118 25		47 23	61 32
residual damage	13.1	21.2	28.5	48.9	52.4

It would seem, therefore, that age rather than the duration of the toxaemia is the determining factor in permanent renal damage, and it may well be that at least some of these patients would have suffered from hypertension at this particular time of life had all their previous pregnancies been normal or even had they never been pregnant. D. M. Stern

1827. Anuria in Eclampsia Effectively Treated by Intravenous Procaine. (Anuria en la eclampsia: su tratamiento eficaz por la novocaina intravenosa.)

By M. B. R. López. Obstet. Ginec. lat.-amer., 6, 44-51, Jan.-Feb. 1948.

Eclampsia is only a single manifestation of the eclamptic syndrome, which may be associated with other features such as haemorrhage. logically, modern opinion tends to incriminate the placenta, "that endocrine gland suddenly implanted into the hormonal system ". A disturbance of endocrine balance leads in its most advanced stage to the convulsions of eclampsia. Anuria may be a feature of convulsive toxaemia. Deficient blood supply in the affected organs leads to haemorrhage, degeneration, and necrobiosis. suggested that the intravenous injection of procaine may act in these cases of anuria as in other cases associated with spasm, such as bronchial asthmaand spasmodic conditions affecting the retinal vessels. Procaine is given intravenously, 10 ml. of a 1 per cent solution being administered in 5 minutes. A careful watch is kept on the pulse rate, blood pressure, and general condition. The same dose is repeated in 6 hours. Two cases are described in which this treatment was successful in inducing diuresis. In both, anuria followed eclampsia, lasting for 36 hours in one case and 30 hours in the other. In both cases the blood pressure fell and diuresis was rapidly established. The authors conclude that this is a valuable method of treatment, and that it should be instituted early to prevent permanent total renal failure.

[In both these cases hypertonic glucose was given with the procaine, one patient receiving insulin as well. It appears, therefore, that the evidence for the effect of procaine is inconclusive. Cases of total anuria after eclampsia or accidental haemorrhage constitute a difficult clinical problem. In some of these, the condition proves to be a cortical necrosis of the kidneys and death from uraemia ultimately results. Where recovering occurs, the nature of the renal lesion is less certain. The method described here might well be tried in cases of anuria with severe toxaemia but, until a large series of cases has been studied, no definite conclusion can be reached. It is possible that the patients described here might have recovered without treatment, or that the hypertonic glucose may have been responsible for the diuresis.]

Josephine Barnes

1828. A Clinical Study of Toxemias of Pregnancy. Analysis of a Ten Year Period. [In English.]

By I. Liquornik and E. Rabau. Gynaecologia, Basel, 126, 7-21, July 1948. 18 refs.

1829. Prophylaxis as well as Therapeusis in Toxemia of Pregnancy.

By G. G. Greene. Kentucky med. J., 46, 100-104, Mar. 1948. 6 refs.

1830. Histidine and Histamine Metabolism in Normal and Toxaemic Pregnancy. (Ueber den Histidin- und Histaminstoffwechsel in der normalen und toxämischen Schwangerschaft.)

By R. Kapeller-Adler, Wein. klin. Wschr., 60, 395-398, June 25, 1948. 46 refs.

1831. The Expectant Management of Placenta Previa.

By T. J. WILLIAMS. Amer. J. Obstet. Gynec., 55, 169-176, Jan. 1948. 7 refs.

The results of treatment of 105 cases of placenta praevia at the University of Virginia Hospital during the past 11 years are reviewed. In 41 patients treatment was expectant. The method of treatment and delivery is set out in the following table.

Method of Treatment and Delivery

Method	No.	Per cent
Caesarean section	44	42
Rupture of membranes	32	30
Scalp traction after rupture of		
membranes	2	2
Spontaneous onset of labour		
and delivery	20	19
Version	7	7
Total	105	100

Treatment was active if labour had begun or if the patient was at or near term. In 22 cases classical Caesarean section and in 22 the lower-segment operation were performed. All patients with central placenta praevia were delivered by Caesarean section. It is interesting to note that in 64 patients an attempt was made to diagnose the site of the placenta by various methods of X-ray examination. In 51 of these the X-ray diagnosis was helpful, and in 13 the findings were not conclusive.

There was one maternal death in the series, due to generalized infection on the 5th postpartum day. Twenty-nine children died; 14 were stillborn, and 15 died neonatally. Of these, 10 per cent were in cases treated at or near term and 68 per cent in cases in which pregnancy was terminated before the child attained a weight of 2,500 g.

The treatment of placenta praevia is discussed in detail and follows the usual lines. In some instances, where the presenting part is high and it has been decided to deliver the patient, vaginal examination is not made and the patient is delivered by Caesarean section. By this means some cases of bleeding from a placenta in a normal situation will be treated by Caesarean section, but the author does not consider this a disadvantage. Patients with antepartum haemorrhage should be admitted to hospital. Some [type of patient not specified] are allowed home "with instructions to abstain from sexual intercourse, to permit no vaginal examinations, and to return to the hospital with the first recurrence of bleeding". In 41 cases in which management was expectant there were 5 foetal deaths and 4 premature deliveries; 1 baby born at term died of congenital defects.

[This paper and the discussion which follows should be read together with the following: (1) Macafee, J. Obstet. Gynaec. Brit. Emp., 1945, 52. 313; (2) Sturrock et al., Edinb. med. J., 1947, 54, 496.]

G. Gordon Lennon

1832. Retroperitoneal Haemorrhage in Pregnancy. By J. K. Ogden. Brit. med. J., 1, 389-391, Feb. 28, 1948. 6 refs.

The author describes a case of eclampsia with concealed accidental haemorrhage complicated by a fatal retroperitoneal haemorrhage in the postoperative puerperal stage. The eclampsia occurred at 35 weeks and was accompanied by concealed accidental haemorrhage and marked shock. Conservative treatment was adopted and the patient responded well. A further retroplacental haemorrhage necessitated surgical intervention and a classical Caesarean section was performed; the foetus was macerated. Convalescence was proceeding normally when early on the 4th day the patient suddenly collapsed with signs of internal haemorrhage, failed to respond to resuscitation, and died in 2 hours. Necropsy revealed changes in the liver, kidneys, and spleen consistent with the degree of toxaemia and repeated haemorrhages, and also a severe retroperitoneal haemorrhage, involving mainly the area within the curve of the duodenum but causing rupture of the floor of the lesser sac and massive intraperitoneal haemorrhage. The actual site of the bleeding was not found.

The literature is reviewed; of the 6 reported cases it is observed that in 5 the haemorrhage started in the region of the lesser sac and these were all fatal; in the 1 case in which it started in the pelvic area the patient recovered. It is also noted that in 2 of the previously reported cases toxaemia existed, and it is suggested that this may be of aetiological significance in view of the capillary thrombosis with extravasation of blood which is known to occur in eclampsia. Hugh R. Arthur

1833. Management of Late Hemorrhages of Preg-

By J. H. BLOOMFIELD. Wisconsin med. J., 47, 287-290, Mar. 1948.

1834. The Influence of the War Period on Pregnancy. IV. Influence on Abortions and Premature Deliveries. (Indagini cliniche e considerazioni circa l'influenza del periodo bellico sullo stato puerperale. IV. Influenza sugli aborti e sui parti prematuri.)

By S. Canna. *Ginecologia*, *Torino*, 13, 515-531, Nov. 1947. 8 figs., 49 refs.

The incidence of abortion and premature delivery was studied at the Obstetric School of Novara between 1933 and 1945. Before the war the incidence of abortion in 4.523 pregnant women was 12.2 per cent; during the war it was 15.4 per cent in 4.113 cases. The figures for primiparae were 6.7 and 9 per cent; for multiparae they were 16.5 and

20.6 per cent respectively. For women living in towns the incidence was 10.8 per cent in peacetime and 12.8 per cent in wartime; for those living in the country the figures were 13.7 and 17.6 per cent. The incidence in housewives was 11.7 per cent in peace time and 14.5 in wartime; in factory workers 12.1 and 14.2 per cent; in land workers 14.4 and 21.4 per cent. During the war there was a general slight increase in the incidence of abortion in both primiparae and multiparae. The incidence of premature delivery was 13.8 per cent in peacetime and 21.4 in wartime. This increase was more accentuated in women living in towns and in factory workers.

The author does not consider that abnormal condition of the genital organs or of the ovum, or dysfunction of the endocrine gland, caused the increase in abortion and premature delivery. The incidence of acute infectious diseases did not increase during the war; but there was an increase in the incidence of syphilis during the war. According to Roberto, emotional shock is not a cause of abortion or premature delivery; during the earthquake at Lacedonia in 1930 no abortions occurred among 191 pregnant women. The author believes that the deficiency of fat-soluble vitamins in the diet during the war was a cause of increased interruption of pregnancy.

Rina Saunders

1835. Technique of Therapeutic Abortion. (A propos de la technique de l'avortement thérapeutique.) By L. Portes, M. Mayer, A. Granjon, and M. Bommelaer. Gynéc. et Obstét., 47, 185-192, 1948. 13 figs.

There still remain certain cases where therapeutic abortion is legally justifiable. According to Balard, Broustet, and Mahon, the technical problem depends on the rapidity and simplicity of the operation, the duration of pregnancy, the condition of the cervix, the possible need for sterilization, and the mode of anaesthesia. They recommend curettage in the first 2 months and abdominal Caesarean section under local analgesia from the third till the 7th month.

The present authors consider that dilatation of the cervix may be dangerous, especially when tents are used, and that local analgesia may be quite inadequate. They distinguish two types of case: (r) Conservative therapeutic abortion is indicated when there is a threat of an accident which may endanger the patient's life, although the possibility of future pregnancies has to be considered. Physiological saline is injected into the amniotic cavity after transabdominal puncture with a spinal-puncture needle. Pressure is measured with the Claude manometer. After amniotic fluid has been allowed to flow out [the authors do not state to what extent] the saline solution is injected until the pressure is double the initial pressure. Two to 3

such "lavages" are performed, the amount of saline (and consequently the intrauterine pressure) being augmented each time. The authors have used opaque solutions and carried out the manipulations under radioscopic control. The needle is withdrawn after a final injection. Usually, labour sets in within 24 hours. If pains have not started 8 hours after the 1st injection, a 2nd injection on the 3rd day is followed by the onset of labour. Expulsion is complete.

(2) In cases where the mother's condition precludes further pregnancy, therapeutic abortion is carried out by vaginal hysterotomy with ligation of the tubes. Vaginal hysterotomy, though less traumatizing than abdominal hysterectomy, is only performed in multiparous women who have been pregnant less than 3 months; this ensures that exteriorization of the uterus and tubal ligation and section can be carried out. On the evening before operation the vagina is packed with gauze dipped in a solution containing 100,000 units of penicillin. The authors usually operate under epidural or spinal analgesia. The operation consists, briefly, in an anterior longitudinal colpotomy, vaginal exteriorization of the fundus (if necessary, at 21/2 to 3 months after puncture of the amnion), median hysterotomy on the posterior surface of the uterus, enucleation of the ovum (often spontaneous), suture of the uterine incision with two continuous sutures. double ligature, and section exteriorization, between the two ligatures of both tubes with subsequent burying of the medial stumps under the anterior uterine peritoneum, reposition of the uterus, and suture of the colpotomy incision in the usual manner. The patient receives 200,000 units of penicillin per day during the 5 following

1836. Immediate Foetal Death After the Use of the Root of Saponaria in Artificial Abortion. (Művi vetélés kapcsán szappangyökérrel közvetlenül okozott magzati halál.)

By J. GAÁL. Orv. Lapja, 4, 14, Jan. 4, 1948. 2 figs.

Artificial abortion is still prevalent in Hungary despite vigorous measures against it. Mechanical methods are most commonly used, and among them the introduction of the sharpened root of saponaria into the uterus is particularly popular. In the case reported here a pregnancy of 4 months' duration was terminated in this way. The root had perforated the abdominal wall of the foetus, damaged its abdominal organs, pierced the diaphragm, and injured the heart. Apparently the wall of the uterus was damaged as well, but the injury was not perforating. After instrumental evacuation of the uterus and treatment with penicillin and sulphathiazole the woman, who had been admitted to hospital with fever and rigors, rapidly recovered. Vilma Samet

1837. A Clinical and Histopathologic Study of Lesions of the Cervix Uteri during Pregnancy.

By C. F. FLUHMANN. Amer. J. Obstet. Gynec.,

55, 133-150, Jan. 1948. 13 figs., 9 refs.

The basis of this study is an analysis of the findings in a series of 89 cases of gross abnormality of the cervix in which a biopsy was obtained or hysterectomy was performed. All stages of gestation are represented. The lesions encountered were: cervical polypi, 37; so-called erosions, 32; carcinoma, 10; condyloma acuminata, 5; endometrial polypi, 3, lencoplakia, 2. The author reviews the literature on the normal cervix in pregnancy.

To obtain information on erosion of the cervix during pregnancy a series of 119 consecutive cases (all private patients) was analyzed. The results are given in the following table.

Incidence of so-called Cervical Erosion at First Prenatal Visit.

Month	Gravida I		Gravida II or More		Total	
of Preg- nancy	Crosion	No Erosion	Erosion	No Erosion	Lrosion	No Erosion
2 3 4 5 6 7 8 9	11 10 3 6 2 2 2 3 0	22 6 0 2 1 0	6 5 1 3 1 3 1	12 5 7 0 3 0	17 15 4 9 3 5 4	34 11 7 2 4 0 3 1
Total	37	34	20	28	57	62

At the first antenatal examination an erosion was seen in 48 per cent of all groups. There was little difference between primigravidae and multigravidae.

There were no associated symptoms in 19 out of the 32 so-called erosions. There was spontaneous bleeding in 6 cases, and "spotting" or blood-tinged discharge in 5. The histological changes at the sites of the erosions varied greatly and are considered under the following headings: (a) adenomatous proliferation of the glands; (b) papillary outgrowths; (c) oedema and increased vascularity; (d) infiltration with inflammatory cells; (c) epidermization, with hyperactive basal cells and hypertrophy of squamous epithelium; (f) formation of decidua. The author considers that although some cervical erosions result from an inflammatory condition which may have existed before pregnancy, most of the cervical erosions seen during pregnancy are not the result of cervicitis but represent a type of C. Gordon Lennon adenoma.

1838. Conception, Pregnancy, and Labour in a Case of Submucous Fibroids. (Konzeption, Gravität und Partus bei submukosen Myom.)

By H.-W. KAYSER. Zbl. Gynäk., 69, 1244-1248, 1947. 2 figs., 42 refs.

1839. Uterine Fibroids in Pregnancy and the Puerperium. (Fibromiomi uterini in gravidanza ed in puerperio.)

By G. Taricco. Ginecologia, Torino, 14, 257-272, June, 1948. 1 fig., bibliography.

1840. Torsion of a Pregnant Uterus with Rupture. By S. L. Siegler and L. M. Silverstein. Amer. J. Obstet. Gynec., 55, 1053-1057, June, 1948. I fig., 16 refs.

1841. Hydatidiform Mole in a Twin Pregnancy with a Viable Foetus.

By H. V. Mishler, G. R. Dickerhoof. Ohio St. med. J., 44, 714-715, July, 1948. 13 refs.

18.12. Massive Gastric Hemorrhage in Pregnancy. By J. CARANGELO and T. D. EFSTATION. Amer. J. Obstet. Gynec., 56, 191-194, July, 1948. 4 refs.

1843. Pregnancy Following an Interilio-abdominal Amputation. (Sacroiliac Disarticulation or Hemipelvectomy.)

By H. L. WILCOX, Amer. J. Obstet. Gynec., 55, 1068-1070, June 1948. 2 figs., 2 refs.

1844. Intestinal Obstruction in Pregnancy Due to Volvulus of Sigmoid. (Obstrucão intestinal na gravidez por volvo do sigmoide.)

By J. AMORIM, A. R. MARTÍNEZ, and L. DE ALMEIDA. Obstet. Ginec. lat.-amer., 6, 165-173, May 31, 1948. 3 figs., 31 refs.

1845. Peptic Ulcer during Pregnancy with a Report of a Case of Perforation.

By D. W. JAMES. Brit. med. J., 2, 74-75, July 10, 1948. 6 refs.

1846. Acute Leukaemia and Pregnancy. (Leucemia aguda y embarazo.)

By J. Bazán, F. A. U. IMAZ, and J. A. FERNÁNDEZ. Obstet. Ginec. lat.-amer., 6, 145-164, May 31, 1948. 6 figs., 31 refs.

1847. Pregnancy Associated with Polyostotic Fibrous Dysplasia.

By R. B. Nelson. Med. Ann. Distr. Columbia, 17, 157–159 and 189–190, Mar. 1948. 4 figs., 4 refs.

1848. The Influence of the War Period on Pregnancy. III. Influence on Sympathetic Disturbances. (Indagini cliniche e considerazioni circa l'influenza del periodo bellico sullo stato puerperale. III. Influenza sui fenomeni simpatici.)

By S. CANNA. Ginecologia, Torino, 13, 497-514,

Nov. 1947. 4 figs., bibliography.

The author has continued his series of investigations into the influence of war conditions on pregnancy. He presents a comparative and statistical survey of disturbances of the sympathetic nervous system during peace and war and in 8,636 cases at the Obstetric School of Novara between 1933 and 1945. The patients were divided into:

(1) housewives; (2) factory workers and land workers. Primiparae and multiparae were investigated separately. A further two groups consisted of women living in town and country. The influence of war conditions on pregnant women was undoubtedly related to their social condition and to their parity. The number of cases without sympathetic disturbances increased progressively between 1933 and 1945, with a minimum of 16.2 per cent in 1934 and a maximum of 40.5 per cent in 1945, and the number in which sympathetic disturbances were very accentuated decreased progressively during the same period, with a maximum of 30 per cent in 1935 and a minimum of 5.1 per cent in 1945. For primiparae without sympathetic disturbances the figures were 29.7 per cent before the war and 35.4 per cent in wartime; for multiparae they were 23.7 and 36.2 per cent. The decrease in incidence of pronounced sympathetic disturbances was greater in multiparae. There were no great differences in this respect between urban and rural dwellers. The decrease in incidence of accentuated sympathetic disturbances was most evident in housewives (from 25.7 per cent before the war to 7.1 per cent during the

Many authors have suggested that the cause of sympathetic disturbances in pregnancy is hyperexcitability of the nervous system. If this were the case the war should have brought about an increase in such phenomena. Endocrine and ovarian factors are also unrelated to the observed fall in incidence of sympathetic disturbances. It is thought that diet played an important part.

Rina Saunders

1849. The Determination of the Prognosis of Pregnancy in Rheumatic Heart Disease.

By J. J. Bunim and J. Rubricius. *Amer. Heart J.*, 35, 282-297, Feb. 1948. 1 fig., 58 refs.

Observations were made in 142 pregnant women with rheumatic heart disease through pregnancy and the puerperium; the literature on the subject was studied. It is concluded that pregnancy itself has little effect on the prognosis in rheumatic heart disease.

H. E. Holling

1850. Maternal Rubella During Pregnancy as Cause of Congenital Cataract and Other Congenital Malformations. [In English.]

By M. BARDRAM and P. BRÆNDSTRUP. Acta ophthal., Kbh., 25, 353-367, 1947. 32 refs.

This paper reviews the evidence that an attack of rubella in the first 3 months of pregnancy may cause cataract and other malformations in the baby. The histories of 8 Danish cases of malformations in the child after maternal rubella are reported in detail. In these children, one of whom was stillborn and one of whom died at 6 months, the following malformations were seen: cataract (7 cases), microphthalmus (1 case), pigmentary de-

generation of retina (3), incomplete iris coloboma (1), morbus cordis (5), peculiarly long trunk (1) long fingers and toes (1).

A. Pirie

1851. Some Virus Diseases During Pregnancy and Their Effect on the Foetus. (Nagra virussjukdomar under graviditet och deras verkan på fostret.)

By H. GRONVALL and P. SELANDER. Nord. Med.,

37, 409-415, Feb. 27, 1948. 43 refs.

In 1941 Gregg of Sydney observed congenital cataract and other abnormalities of the eyes as well as heart disease in 13 children whose mothers had suffered from rubella early in pregnancy. Adding 65 similar cases observed by his colleagues, Gregg found among the total of 78 mothers as many as 68 with a history of rubella.

The present authors have extended the study of this phenomenon to various other virus diseases in Sweden and to the question whether rubella has the same teratogenous action in Sweden as it seems to have in Australia. Their investigation was started in September 1945, in hospitals in Stockholm, Lund, Malmö, Uppsala, Gothenburg, and Kristianstad. The investigation followed two lines: (1) an examination of children whose mothers had suffered from such diseases as rubella, measles, chickenpox, mumps, infective hepatitis, or anterior poliomyelitis during pregnancy; (2) a search for records of virus diseases during the pregnancies of the mothers of children suffering from certain deformities. Scarlatina, though not a virus disease, was included in this investigation as it has been thought to damage the foetus.

The findings of this investigation are incorporated in 5 tables, which deserve study in the original. Table 4, on the frequency of certain virus diseases during the pregnancies of mothers giving birth to congenitally defective infants, shows that among 354 such mothers there were 5 who had rubella, I measles, I chickenpox, and 5 mumps during pregnancy. There were also at least 3 who had suffered from hepatitis, and at least 2 from poliomyelitis. Thus 5.1 per cent of these mothers had suffered from some virus disease during pregnancy. According to Table 2, there had been a virus disease in only 0.47 per cent of the many thousands of mothers who were confined in maternity hospitals and who served as controls. This suggests that the virus diseases in question were about 10 times as frequent among the mothers of defective infants as among the controls.

The authors conclude that rubella, mumps, infective hepatitis, and anterior poliomyelitis may injure the foetus, though rubella in this respect may be much less dangerous in Sweden than it seems to be in Australia; in the latter country it has been suggested that rubella early in pregnancy is an indication for inducing abortion. More light would be thrown on this problem if notification of these virus diseases as soon as they occur in pregnancy were made compulsory.

Claude Lillingston

1852. Diaphragmatic Herniae as a Problem for the Obstetrician. (Uber die zwerchfellbruche als problem des obstetrikers.)

By O. Kinnunen. Ann. chir. gyn. fenn., 37, 193-206, 1948. 2 figs., 15 refs.

1853. Effect of Pregnancy on the Course of Experimental Hypertension.

By A. GROLLMAN. Amer. J. Physiol., 151,.373-

379, Dec. 1947. 25 refs.

At the Southwestern Medical College in Dallas. Texas, hypertension was induced in rats, rabbits, and dogs by applying a constricting figure-of-eight band either to both kidneys, or to one kidney, the other being removed. This induced a chorionic constant elevation of blood pressure without a malignant phase. Blood pressure in the rat was determined by plethysmograph, in the rabbit by auscultation over the abdominal aorta, and in the dog by a direct mercury manometer reading after femoral-artery puncture. In hypertensive rats (36 animals) pregnancy caused a fall in blood pressure varying between 10 and 65 mm. Hg, except in 1 case. Pseudo-pregnancy induced by stimulating the cervix also induced a fall in blood pressure. The larger the litter the greater the fall. Rabbits ovulate only with coitus. In 20 pregnant animals changes were similar to those found in the rat, and again the larger the litter the greater the fall in blood pressure. Five pregnancies were observed in 3 bitches; there was only a moderate fall in blood pressure during the second half of pregnancy. The larger the animal the smaller is the size of the products of conception relative to the maternal mass; the larger the animal also the smaller is the fall in blood pressure in the hypertensive pregnant female. These findings support the contention that essential hypertension itself is not an indication for terminating pregnancy. Eclampsia is an acute condition due to the elaboration by the ischaemic kidney of a pressor agent, not elaborated in chronic hypertension. Elliot E. Philipp

1854. The Rh Negative Mother in Private Obstetrical Practice.

By R. A. West and N. C. Siebert. J. Kansas mcd. Soc., 49, 285-286, July 1948. 9 refs.

1855. Pregnancy and Tuberculosis. (Zwangerschap en longtuberculose.)

By G. Lam. Geneesk. Gids., 26, 335-339, July 15, 1948.

1856. The Pathergic State in Various Phases of Pregnancy and the Puerperium in Tuberculous Women. (Lo stato patergico nelle varie fasi di gravidanza ed in puerperio, in donne affette da esiti di forme tubercolari.)

By A. Borso. Ginecologia, Torino, 14, 189-201,

May 1948. 4 figs., 20 refs.

1857. Ectopic Pregnancy.

By W. D. BEACHAM, C. G. COLLINS, E. P. THOMAS, and D. W. BEACHAM. J. Amer. med. Ass., 136, 365-371, Feb. 7, 1948. 8 figs., 14 refs.

The authors reviewed the series of 1,059 patients with ectopic pregnancy admitted to the New Orleans Charity Hospital since 1906. The incidence varied from 2.79 per cent of the obstetrical admissions in the case of white women and 1.96 per cent in the case of negresses, to 0.95 per cent and 0.59 per cent respectively during the four 10-year periods. It is believed that the lower figure of 0.59 per cent more accurately represented the correct incidence in relation to gestation at term. When these figures were compared with the gynaecological admissions it was found that the incidence was higher in the negro race than in the white. Salpingitis was also more common in negresses. Most cases in the negro group occurred in patients between the ages of 21 and 30, while in the white group the greatest incidence was between the ages of 26 and 35. In 97 per cent of the cases the chief complaints were pain, pain and bleeding, or bleeding. Amenorrhoea for 2 months before the onset of other symptoms occurred in 18.5 per cent of the cases, while 14.3 per cent had 3 months' amenorrhoea. In 1.71 per cent the symptoms developed during an apparently normal period, while 4.7 per cent stated that they had had a a normal period a fortnight before.

The authors explain the importance of a gentle but careful pelvic examination in all suspected cases, and advise exploratory puncture of the pouch of Douglas where there is doubt. The leucocyte count was found to be of little value in differential diagnosis. A correct preoperative diagnosis was made in 82 per cent of cases in the last decade. The treatment varied from unilateral salpingectomy to hysterectomy, which was performed 63 times in the last 373 cases with 11 deaths J. Stallworthy

in this series.

1858. On Hysterosalpingography and Extra-uterine Pregnancy. [In English.]

By H. SKJOLBORG. Acta radiol., Stockh., 29,

456-460, May 31, 1948. 4 figs., 12 refs.

1859. Further Observations on Ectopic Pregnancy. By F. E. WHITACRE and T. BRYAN. J. med. Ass. Alabama, 18, 1-4, July 1948.

1860. Congenital Absence of One Ovary Associated With Contralateral Tubal Pregnancy.

By J. A. Kurcz and M. S. Sharp. Amer. J. Obstet. Gynec., 55, 1065-1067, June 1948. 9 refs.

1861. The Diagnosis and Treatment of Abdominal Pregnancy.

By F. E. WHITACRE and H. D. LYNN. Sth. Surg.,

13, 635-644, Sept. 1947. 2 fig., 15 refs.

A series of 12 abdominal pregnancies is reported. Secondary abdominal pregnancy is far more common than primary abdominal pregnancy. The existence of the latter is often doubted; the condition is more likely to be secondary to tubal abortion or rupture.

Cases in which there is no evidence of origin from a primary intrauterine or intratubal position and in which the ovary is not involved in the placental site are designated cases of primary abdominal pregnancy. The number of such proved cases is small. There are two types of secondary abdominal pregnancy-the intra-peritoneal and the intra-alimentary. The authors' 12 cases occurred among 13,926 deliveries. There were no maternal deaths, although maternal and foetal mortality was high in other series quoted from the literature. Correct diagnosis before operation is not easy. The history of the case and a careful examination of the patient should suggest the presence of abdominal gestation. Hysterography has been used in diagnosis, as also have pneumoperitoneograms and amniography.

The ages of the patients ranged from 19 to 39 years, the average being 29.4 years. Three of the patients had had no children. In 4 of the patients pregnancy had continued for 4 months, in 3 for 5 months, in 1 for 7, and in 1 for 8 months; there were 3 full-time pregnancies. Three infants were born alive, and 1 infant was stillborn; there were 7 pre-viable foetuses or lithopaedions, and 1 macerated foetus was born at 6 months. Of the 3 infants born alive 2 were delivered at term and 1 was born at the 8th month.

In 9 of the 12 patients the history suggested the diagnosis. Radiographs were taken in 10 cases; in 6 of these the extrauterine foetus was clearly shown. Transverse lie was common. A correct diagnosis was made pre-operatively in 7 cases. In 4 cases in which the placenta was removed, pregnancy was in the 4th or 5th month, the foetus was dead, and the placenta thrombosed and easy to separate. Of the other cases, in which the placenta was left intact, abscesses developed in 2. At the original operation neither drainage nor marsupialization was carried out.

There are three ways of dealing with the placenta at the primary operation: (1) by complete excision; (2) by marsupialization; (3) by non-intervention (the method of choice). The cord is ligated and cut close to the placenta. If the baby is dead and conditions permit, it is best to allow several weeks or months to elapse before operation so that the blood vessels can seal off and bleeding thus be minimized.

Lilian Raftery

1862. Primary Abdominal Pregnancy in the Lesser Peritoneal Cavity.

By N. D. ELZEY. West. J. Surg. Obstet. Gynec., 56, 410-413, July 1948. 53 refs.

## LABOUR.

1863. The Blood Picture in Labour and the Early Puerperium, in the Umbilical Cord, and in the Foetus at Term. (Il quadro ematologico in travaglio di parto nei primi giorni di puerperio, nel funicolo ombellicale e nel neonato a termine.)

By G. Colucci and G. Vincenti. Riv. ital.

Ginec., 30, 323-337, 1947. 38 refs.

Haematological examinations have been carried out on 20 healthy women in labour and in the first days of the puerperium, and on 20 newborn infants immediately after delivery and in the first days of life; in 7 of the infants the blood in the umbilical vessels was also examined. Delivery was physiological in 15 patients; 5 had a Caesarean section for contracted pelvis. Ten healthy non-pregnant women between the ages of 18 and 28 years and the same number of children between the ages of 2 and 6 years served as controls.

Results showed that there is no relation between the pictures of maternal and foetal blood, of maternal blood and cord blood, or of foetal blood and cord blood. Maternal oligocythaemia does not exist during labour, but there is a hypochromic anaemia, perhaps related to environmental, nutritional, and constitutional factors. A reduction in the number of erythrocytes was observed on the 2nd day of the puerperium compared with the number present during labour; this reduction was less apparent by the 4th day of the puerperium and the count became normal by the 8th day.

A polycythaemia exists in the foetus at term, and in 91 per cent of the cases the count increases until the 2nd day of life and then gradually decreases. A distinct anisocytosis and macrocytosis is present until the 24th hour of life. The erythrocyte count in the newborn infants appears to be always greater than that in the umbilical cord and in the mother in labour. Inversion of the leucocyte formula takes place on the 5th day of life and not on the second, as suggested by other workers. The authors believe that the trauma of normal labour does not cause polycythaemia in the newborn. since the blood counts of infants born after normal labour and of those delivered by Caesarean section were similar. The examination of blood from umbilical arteries and veins did not reveal differences. Rina Saunders

1864. Nutrition, Serum Proteins, and the Quality of Contraction in Labour. (Alimentación, protinemia y calidad de trabajo en el parto.)

By L. L. MERCADO. Obstet. Ginec. lat.-amer.,

5, 420-429, Sept. 1947. 6 refs.

The relation between the diet consumed during pregnancy and the nature of uterine action during labour has been investigated in 100 patients in Colombia. In 30 patients the diet consisted largely of maize, though in some cases meat and fish were consumed; in 35 patients the feeding was carried

out by the Inter-American Service of Public Health. and in 35 patients of the wealthy class the amount of protein was adequate and calcium and vitamins were added. The specific gravity of the blood and serum, and haemoglobin value and serum-protein level were estimated. The cases were classified in 3 groups according to the level of the serum proteins. In the 1st group of 20 patients, in whom the serum protein level was between 45 and 80 per cent of normal, the diet was largely a carbohydrate one, and a condition almost amounting to a "physiological diabetes of pregnancy" was found. In these patients there were excessive gain of weight, oedema, and slight hypertension, but lactation was found to be very good. Uterine action was unsatisfactory, and in 3 patients there was inertia. In 22 patients with serum protein levels between 80 and 90 per cent, uterine action was more satisfactory. In the 3rd group of 57 patients with serum protein levels between 90 and 110 per cent, uterine action was excellent. In these patients the diet was ample, and contained adequate milk, meat, fish, eggs, and cheese.

The author draws the provisional conclusions that an adequate amount of protein in the diet favours satisfactory uterine action in labour, and that while a defective diet with excess of carbohydrates produces oedema and slight hypertension, an adequate

supply of carbohydrate helps lactation.

Bryan Williams

1865. A Method of Induction of Labour. (Un procedimiento para la inducción del parto.)

By E. VALENZUELA SAEZ. Bol. Soc. chil. Obstet.

Ginec., 12, 97-108, July 1947. 10 refs.

The author reviews the usual methods of induction of labour, which fail in between 30 and 50 per cent of cases. A considerable foetal mortality has been reported with Aburel's method; in the author's experience one maternal death was associated with it, the actual cause of death being uncertain. [In the discussion on this paper, two speakers referred to the risks of Aburel's method.] The results are reported of the intravenous and intramuscular injection of a quinine-calcium preparation, together with artificial rupture of the membranes in some cases. [The composition of the quinine-calcium preparation is not stated.] In 8 cases in which the injections alone were given there were 4 failures, but in 12 cases in which the injections were followed by artificial rupture of the membranes there were no failures. The author considers the method to be free from risk for mother and baby.

Bryan Williams

1866. Diagnosis and Treatment of Labour with Postmature Foetus. (Zur Diagnose und Therapie der Spätgeburt.)

By H. Heberer. Geburtsh. u. Frauenheilk., 8,

503-510, June 1948. 9 refs.

1867. The Management of Prolonged Labour. By F. C. Spencer. Hawaii med. J., 7, 389-391, May-June 1948.

1868. Difficult and Delayed Labour.

By D. N. HENDERSON. Bull. Vancouver med. Ass., 24, 267-272, May 1948.

1869. The Management of Occipito Posterior Positions.

By C. J. McDevitt. Kentucky med. J., 46, 269-271, July 1948.

1870. Cervical Dystocia, with Special Reference to the Fibrous Nature of the Cervix.

By O. H. SCHWARZ and R. B. WOOLF. Amer. J. Obstet. Gynec., 55, 151-168, Jan. 1948. 18 figs., 3 refs.

The authors of this article stress the fibrous nature of the cervix as the cause of functional rigidity in the elderly primipara. They state that annular detachment of the cervix takes place at the fibro-muscular junction. This was determined by the study of tissue from two such cases. It is asserted that amputation of the cervix leads to premature labour, because, when the fibrous part of the cervix is removed, there is no structure to keep the uterus from dilating. On the other hand, after conization of the cervix spontaneous delivery is not affected. The work of Danforth (Amer. J. Obstet. Gynec., 1947, 53, 541) on "the fibrous nature of the human cervix, and its relation to the isthmic segment in gravid and non-gravid uteri " is confirmed. G. Gordon Lennon.

1871. Effect of a Sympathicolytic Drug on the Spastic Cervix. (Wirkung eines Sympathikolytikum beim spastichen Muttermund.)

By H. SAUTER. Gynaecologia, Basel, 125, 87-

103, Jan.-Feb. 1948. 9 figs., 17 refs.

The author, who has carried out his research at the Women's Clinic of the University of Zürich, considers that the sympathetic nervous system innervates the cervix; he summarizes the literature on this most controversial subject.

Acting on his belief, he searched for a substance which, by inhibiting the sympathetic, would enable the cervix to dilate; he claims that yohimbine is such a substance. Its aphrodisiac action is due to dilatation of the pelvic blood vessels and relaxation of the pelvic musculature. Like ergotoxine it has two active components. The drug was used on 55 patients in labour, including 49 primiparae in whom signs of cervical rigidity, not responding to the usual sedatives and opiates, were present. This number was out of a total of 668 primiparae delivered in a period of 6 months. The dose was o.o. g. orally or intramuscularly. A study of the lengthy case histories reveals that there were rapid softening, increase of clasticity, and dilatation of the hitherto inelastic cervix. An improvement in the type of pains was also claimed.

Delivery followed in most cases in from 4 to 8 hours after administration of the drug.

[In the discussion which followed this paper such authorities as Guggisberg of Berne and Frey of Zürich disputed the anatomical, physiological, and pharmacological basis of the experiments. The author had used a variety of other drugs in the series in which he claims success with yohimbine. It would seem worth while to attempt a properly controlled series of deliveries with spasmolytic drugs of this nature in cases of rigid cervix.]

Elliot E. Philipp

1872. The Oxytocic Use of Methergine in the Third Stage of Labour.

By J. E. TRITSCH, E. SCHNEIDER, and E. F. LONGWORTH, N.Y. St. J. Med., 48, 293-294, Feb. 1, 1948. 4 refs.

In a total of 911 cases "methergine" (methylergometrine) was given intravenously to 810 patients and intramuscularly to 101 patients in the third stage of labour in doses of 1 ml. containing 0.2 mg. No toxic effects were observed. Postpartum blood loss was apparently reduced, an average of 115 ml. being lost after intravenous administration. Manual removal of the placenta was necessary in 7 cases.

S. S. B. Gilder

1873. The Intrauterine Pack in the Management of Postpartum Haemorrhage.

By L. A. DAY, R. D. Mussey, and R. W. DEVOE. Amer. J. Obstet. Gynec., 55, 231-243, Feb. 1948. 23 refs.

In this paper from the Mayo Clinic the authors review the literature on the use of the intrauterine pack in the management of postpartum haemorrhage. Some authors condemn the employment of the pack, alleging that it prevents uterine retraction and that a haemorrhage that would otherwise be revealed is converted into a concealed one. Others say that the pack should be used as soon as it becomes evident that haemorrhage is not being controlled by the usual measures. If bleeding continues after delivery of the placenta and is not controlled by massage of the fundus and intramuscular or preferably intravenous administration of ergot the authors pack the uterus with sterile gauze, using a packing forceps. In cases of severe bleeding from an atonic uterus the vagina is also tightly packed. When the delivery has been complicated by placenta praevia, uterine and vaginal packs are usually inserted as a precautionary measure even though bleeding is not pronounced. Uterine tamponade has been employed in the Mayo Clinic since 1918. In 12,000 deliveries it was used 267 times. Not only is it used in cases of haemorrhage but also as a prophylactic after manual removal of the placenta when the uterus is atonic and firm contraction is not induced by other methods. Six of the patients continued to bleed through the pack but the bleeding was controlled by re-packing in 3 of the cases. In the other 3 it was not controlled and hysterectomy had to be performed. In one of these cases there was a marginal placenta praevia. The morbidity rate was not any higher among the patients in whom a pack had been inserted than among other patients with anaemia after postpartum haemorrhage. One patient, however, died on the 8th day of the puerperium, apparently from a haemolytic streptococcal infection in the days before chemotherapy. The authors conclude that the pack has a definite place in the management of postpartum haemorrhage.

In the discussion that followed this paper opinion was about equally divided on the value of packing. Some condemned it as being unnecessary in the less severe cases and futile in the more severe ones. It was pointed out by Bill of Chicago that often a few minutes after firm packing the uterus will relax and fill with blood behind the pack. [This would seem to be the chief objection to the method—that the uterus is alternately contracting and relaxing and that it is therefore impossible to be sure of fulfilling the essential purpose of the pack, to exert continuous pressure on the bleeding point.]

F. J. Browne

1874. The Dosage of "Methergine". (Ueber die Dosierung von Methergin.)

By H. SAUTER. Schweiz. med. Wschr., 78, 162-

163, Feb. 21, 1948. 5 figs., 4 refs.

Tonometric investigations and clinical observations confirmed the fact that the dose of "methergine" (methylergometrine) employed at present (1 to 2 ml. or 0.2 to 0.4 mg.) is too high for the treatment of postpartum haemorrhage due to atony. The maximal and most prolonged contractions can be achieved with 0.25 ml. of methergine.

Harold Jarvis

1875. Fatal Hemorrhage Associated with the Third Stage of Labor. A Study of 60 Maternal Deaths, Brooklyn 1937-1947.

By M. Glass and A. H. ROSENTHAL. N.Y. St. J. Med., 48, 159-165, Jan. 15, 1948. 9 refs.

Sixty cases of death from haemorrhage in the third stage of labour are reviewed; the causes of haemorrhage were: (1) atony of uterus, 40 cases; (2) retention of placenta, 12 cases; (3) inversion of uterus, 5 cases; (4) varied causes, 3 cases.

(1) Atony of the uterus. Ten patients with premature separation of a normally implanted placenta died of postpartum haemorrhage superimposed upon antepartum or intrapartum bleeding. In 6 vaginal deliveries the placenta was delivered more half an hour after the child, and manual removal was required in 3 cases. Fibroids, prolonged labour, and over-distension were all predisposing factors. So, according to the authors, was general anaesthesia. (2) Retention of the placenta. Twelve fatal haemorrhages were associated with retention of placental tissue; 5 of the patients died with the placenta completely retained. One woman died in

hospital 36 hours after a normal delivery, having been returned to bed with the placenta retained. (3) *Inversion of the uterus*. Manual expression of the placenta with or without traction on the cord accounted for 4 of the 5 recorded cases.

Forty-one patients died within 5 hours of delivery, 29 being dead within 3 hours. In 80 per cent of the cases either no blood or an insufficient amount of blood was given. A strong plea is made for prenatal blood grouping and determination of the Rh factor. The uterine pack is advocated, although it was used unsuccessfully in 31 of the cases analyzed. In some cases of uterine atony the placenta was allowed to remain in the uterus for more than 1 hour despite a blood loss exceeding 1,000 ml. In the majority of cases the period between haemorrhage and death, though brief, was sufficient for adequate blood replacement to have been carried out. Four cases of inversion of the uterus occurred because of mismanagement of the third stage.

'[This article is a salutary reminder of the heavy maternal mortality arising from mismanagement of the third stage of labour and of the need for: (1) adequate antenatal supervision so that anaemia may be corrected and blood and Rh group determined, and (2) provision of adequate facilities for rapid blood transfusion.] Leslie A. Cruttenden

1876. Haemorrhage in Obstetrics: the Relation Between the General Practitioner and Emergency Services.

By R. E. Soldenhoff. *Edinb. med. J.*, 55, 302-315, May 1948. 6 refs.

#### ANAESTHESIA.

1877. A New Apparatus for Obstetric Analgesia. (Et Nyt Obstetrisk Analgesi-apparat.)

By E. T. Morch. *Ugeshr. Laeg.*, 30, 856-857, July 22, 1948. 1 fig.

1878. Comparative Study of Three Methods of Anaesthesia and Analgesia in Obstetrics. (Estudio comparativo de tres metodos de analgesia y anestesia en obstetricia.)

By G. A. DE LA VEGA, R. GARCIA ROLL, M. MARISCAL, and R. BRISENO. Rev. méd. Hosp. gen., 11, 241-252, Apr. 1948. 11 refs.

1879. Intravenous "Recorcain" (Procaine) Analgesia in Labour. (Analgesia in travaglio di parto con recorcaina endovenosa.)

By A. SALVINI and F. FERRERO. Riv. ital. Ginec.,

30, 397-407, 1947. 8 refs.

The authors have studied the production of analgesia in labour by intravenous injections of r per cent procaine in 5 per cent glucose solution. Of the 10 women treated 5 were primigravidae and 5 multigravidae. The drug was always given during

the second stage of labour at an average rate of 4 to 8 ml. per minute; as little as 70 ml. in some cases and as much as 232 ml. in others was found necessary. The average time required to obtain analgesia was 5 to 10 minutes. Before commencing the injection 1 drop was introduced intramuscularly; blood pressure, pulse rate, respiration rate, and foetal heart rate were observed during the treatment. In each experiment a few ml. per minute was first given and the dosage was increased or decreased according to the local and general reaction obtained in each case; care was taken to avoid too deep a central action of the drug.

The results were very good in 5 cases, good in 3, and poor in 2. During the treatment the patients appeared sleepy and semi-conscious and talked incoherently, but most of them were able to answer questions. In 1 case, soon after the administration began, the patient had a convulsion and became cyanotic and dyspnoeic with a rapid pulse rate; the injection was discontinued and after treatment with artificial respiration, lobeline, and camphor the patient recovered quickly; the injection was not resumed and she had a normal delivery without pain. In 2 other cases convulsive movements began and the injection was discontinued for a few minutes and resumed soon after the patient had recovered. Forceps were used twice because the uterine contractions became weak and there were signs of foetal distress. In all other cases the uterine contractions were unaltered; all the patients were able to bear down during the expulsive period and amnesia is reported in most cases. All the babies were born alive with no signs of distress. The analgesic effect was maintained for some time after delivery. The authors consider their results encouraging, but further study of the method is Rina Saunders needed.

1880. Paraldehyde and Barbiturate Analgesia in Labour.

By R. Mackey. Med. J. Aust., 2, 748-750, Dec.

20, 1947

"Seconal" (sodium allyl (1-methylbutyl) barbiturate) was used in conjunction with paraldehyde to produce analgesia and amnesia in labour. Two capsules (3 g.) of seconal were given as soon as the patient went into labour or on her admission to the labour ward. This was followed in ro to 15 minutes by oral administration of 6 frozen capsules of paraldehyde, each capsule containing 17 minims (1 ml.). The importance of administering the paraldehyde regardless of the initial effect of the seconal is emphasized. A further 2 capsules of paraldehyde were given if the patient woke up between the uterine contractions. On this basis it was found necessary to give paraldehyde capsules almost every hour, not more than 20 capsules being given to any one patient; 279 patients were treated. In 86.7 per cent of cases analgesia and amnesia were complete or almost complete. The sedation was

unsuccessful in 4.7 per cent and unsatisfactory in 8.6 per cent of cases. The average duration of analgesia was 6 hours 22 minutes. The longest period was 27 hours 25 minutes. Labour was not prolonged in any of its stages. The incidence of forceps delivery in primigravidae was 35 per cent and in multiparae r7 per cent. Postpartum haemorrhage, defined as blood loss greater than 20 oz. (568 ml.), occurred in 29 patients—an incidence of r2.4 per cent. There was no increase in foetal or neonatal death rates, or in maternal mortality or morbidity.

T. N. MacGregor

1881. "Nupercaine" Spinal Anaesthesia in Obstetrics. (Report of 100 Cases.)

By J. T. Hugill and C. Gillespie. Canad. med. Ass. J., 58, r46-r49, Feb. r948. r2 refs.

The authors describe a method of low spinal analgesia with I in 200 heavy "nupercaine" for use in obstetrics. This drug is used to alleviate pain in the latter part of the first stage, and during the second stage of labour. Relief of pain lasts for 4 to 8 hours and operative procedures may be carried out per vaginum with the minimum of inhalation anaesthesia. A series of roo cases where spinal analgesia was employed is compared with a similar series in which gas-oxygen-ether was the anaesthetic. No serious complications due to the analgesic were encountered, but there was an increase in the forceps rate and in the incidence of posterior positions of the occiput. On the other hand, postpartum haemorrhage was less common, and fewer of the children required resuscitation. The authors stress that spinal analgesia is only suitable in institutions where skilled anaesthetists are available. D. M. Sheppard

1882. Spinal Anesthesia in More Than Five Thousand Vaginal Deliveries.

By W. C. Rogers. West. J. Surg. Obstet. Gynec., 56, 236-242, Apr. 1948. 7 refs.

1883. Newborn Mortality and Morbidity with Continuous Caudal Analgesia. An Analysis of Cases in New York, Philadelphia and Memphis, with Controls.

By R. A. HINGSON, W. B. EDWARDS, C. B. LULL, F. E. WHITACRE, and H. C. FRANKLIN. J. Amer. med. Ass., 136, 221–229, Jan. 24, 1948. 8 figs., 3 refs.

The authors claim to have demonstrated clearly that all forms of regional nerve-block analgesia for labour reduce infant mortality; they have compared their results with control groups managed with systemic narcosis, general anaesthesia, or no anaesthesia. These methods of nerve-conduction analgesia include local, pudenal and presacral-block, spinal, saddle-block spinal, caudal, and continuous caudal analgesia. This study is primarily concerned with the last-named method, and groups of patients treated in this way are compared with control groups.

In all 7,893 births have been studied, 5,059 of which were managed with continuous caudal analgesia and 2,834 with other methods, including a group of 577 in which no anaesthesia whatever was given. These cases were derived from the U.S. Marine Hospital, New York, the Philadelphia Lying-In Hospital, and the John Gaston Hospital, Memphis, Tenn. These studies all show a considerably lower mortality rate, including both stillbirths and neonatal deaths, when continuous caudal analgesia was given, in spite of the following dangers of the method: (r) Primary intrauterine foetal anoxia resulting from hypotension due to the nerve block of vaso-motor nerves. (2) Arrested or prolonged labours following too early induction of analgesia or extension of anaesthetic levels above the sixth thoracic segment or through the anterior sacral foramina to Frankenhauser's ganglia. (3) Increased incidence of occipito-posterior positions. (4) Increased incidence of operative deliveries. (5) Occasional transplacental foetal hypersensitivity to the analgesic agent used.

In the New York study the total mortality with caudal analgesia (more or less equally divided between stillbirths and neonatal deaths) was 16.2 per 1,000 live births, as against a figure of 28.3 per r,000 for spinal analgesia and r62.2 per r,000 for births in which no anaesthetic was used. The higher rate in patients receiving spinal analgesia is explained by the marked fall in blood pressure which often occurred. In Philadelphia, with caudal analgesia the death rate was 20.6 per r,000 compared with 45.6 in the control group where gasoxygen-ether was the principal anaesthetic method used. It is stressed that the mothers in the 2 groups were strictly comparable as regards age, parity, and other factors affecting labour. In Memphis, where negroes outnumbered whites by 2 to 1, the total mortality was 36.8 per 1,000 live births with caudal analgesia, 74.2 with spinal analgesia, 73.2 with general anaesthesia, and 144 in the large group of 577 cases receiving no anaesthetic. It is pointed out that the higher figures in all groups in this study are probably associated with the greater tendency to stillbirths and neonatal deaths in negroes. Difficulty was experienced in establishing respiration in only 3.6 per cent of infants who survived in the caudal analgesia group compared with 9.6 per cent of infants surviving in the control group. In the caudal analgesia series rr.9 per cent of infants had a net weight gain the first week compared with 9.2 per cent of the control group. More favourable results for caudal analgesia were consistently seen when the groups were broken down into age groups and when premature and mature infants were separated. For purposes of comparison all infants of under 3 lb. (r.35 kg.) weight were excluded from the study, as this would have loaded unfavourably the group not receiving anaesthesia.

The strikingly high figures in both the New York

and the Memphis studies for the group receiving no anaesthesia emphasize the dangers of "uncontrolled tumultuous labour as a cause of anoxia and pressure trauma of the rigid maternal musculature against the soft tissues of the infant," especially where there is voluntary muscular straining. Consequently the authors question the safety for the infant of methods that withhold relief during labour and delivery. [It may be noted that in these cases many deliveries were precipitate or "occurred at times when all available intern and residency supervision was utilized in the delivery of other patients" so that the figures for the group receiving no anaesthesia tend to be unfavourably weighted.]

I. A. Chalmers

1881. Infiltration during Labour of Lumbar Sympathetic with Analgesics of Prolonged Action. (Anesthesiques-retard dans les infiltrations analgésiques du sympathique lombaire au cours du travail.)

By H. PIGEAUD and R. GARMIER. Rev. franç. Gynéc., 43, 210-212, June 1948. 9 refs.

### PUERPERIUM.

1885. Puerperal Inversion of the Uterus and its Spontaneous Reinversion. (Puerperalni děložní inverse se spontánni reinversí.)

By J. SYNEK. Ceshoslov. Gynack., 13, 76-80.

1948. 9 refs.

The case is described of a 37-year-old 3-gravida who, after a pregnancy complicated by mild toxaemia in the last month, had a normal delivery at term. On the sixth day after delivery the uterus became inverted, without evident cause. A careful attempt at reposition failed; further attempts were considered inadvisable, at first because of the shock, later because of a severe anaemia (though there had been no bleeding), and still later because of a recurring thrombophlebitis of both legs. An examination 16 weeks after the inversion, and 5 weeks after the patient had last been examined, revealed a normal uterus. The author thinks that the inversion was caused by the presence of a few small myomata in the anterior wall of the uterus, and the exhaustion of the organism by the toxaemia of pregnancy (which probably also caused the severe anaemia). The restitution of the general condition was accompanied by spontaneous re-A. Rohan inversion.

1886. Penicillin Vaginal Suppositories and the Prevention of Post-partum Morbidity.

By R. R. Pierce. Amer. J. Obstet. Gynec., 55,

313-315, Feb. 1948.

A total of 1,573 patients was delivered at the Cincinnati General Hospital from July 1946 to March 1947. Alternate patients (778) received 200,000 units of penicillin in cocoa-butter suppositories, which were inserted in the posterior fornix

of the vagina with sponge forceps immediately after delivery. The other 795 cases served as controls. Of the 778 patients who received penicillin 18 or 2.3 per cent developed genital-tract infection. There were 42 cases of genital tract infection among the controls, an incidence of 5.3 per cent.

Levels of penicillin in the blood were determined in 49 patients; in 38 the levels averaged 0.06 unit per ml. of serum in half an hour, 0.06 to 0.25 unit at I hour, and 0.06 to I unit in 2 hours. The absorption of penicillin seemed to depend on the

amount of bleeding postpartum.

[The nature of the organisms causing the puerperal infection is not stated.] D. M. Stern

1887. Treatment of Puerperal Mastitis with Penicillin. (Uber die Behandlung der Mastitis puerperalis mit Penicillin.)

By W. NEUWEILER. Pranis., 37, 21-23, Jan. 15,

1948. 5 refs.

In cases of puerperal mastitis at the University Maternity Hospital, Berne, 50,000 to 80,000 international units of crystalline sodium penicillin in 10 to 20 ml, normal saline solution are injected into the inflamed area in two places. After the injection an ice-bag is placed over the breast. The injection is given daily for 5 to 7 days. A day or two after the first injection the inflammation starts to subside—the area becomes smaller, very firm but painless, and subsides slowly after 14 days. The resorption of this firm mass is hastened by the application of heat. If there is an abscess when the patient is first seen, similar treatment is given, but in addition a small puncture is made, as much pus as possible is evacuated, and the abscess cavity is filled with penicillin. The maximum dose of 80,000 units is given in these cases. The abscess is only opened widely if the pus is thick and cannot be aspirated. In the early days of penicillin treatment of mastitis intramuscular injections were also given but the results were no better.

Kastle lias shown that penicillin is not excreted in recognizable amounts in the milk. In the majority of cases of puerperal mastitis the infection spreads slowly along the milk ducts, hence if there is no penicillin in the ducts after intramuscular injection its use appears to be valueless. In cows puerperal mastitis is successfully treated by injection of penicillin to the milk duct, but this treatment is not feasible in women because of the large number of milk ducts opening on the nipple. The author investigated the growth of organisms in the milk of patients with mastitis who were treated by intramuscular injection of penicillin; doses of 200,000 units did not inhibit their growth, but intramammary injections of 50,000 to 80,000 units inhibited the growth-80,000 completely, 50,000 less effectively, and 30,000 not at all.

After local mammary injections only relatively small quantities of penicillin in a few cases passed over into the milk.

Gladys Dodds

1888. Cure of 3 Cases of Puerperal Infection Due to Clostridium perfungens. (Trois cas de guérison de septicémies puerpérales à perfringens.)

By P. TRILLAT and A. NOTTER. Rev. franç. Gynéc., 43, 225–234, June 1948. 28 refs.

## LACTATION.

1889. The Value of Ethinyl-Oestradiol in the Inhibition of Lactation. (El valor del etinil-estradiol como inhibidor de la secreción láctea.)

By R. M. Gori and E. Bayona. Obstet. Ginec. lat.-amer., 5, 448-495, Oct. 31, 1947. 32 refs.

Reports in the literature show that both the natural and synthetic oestrogens when given in adequate doses inhibit lactation, and some authors have also given progesterone and the androgens for the same purpose. There have been few reports on the use in the puerperium of ethinyl-oestradiol, which is a powerful oestrogen having a potency similar to that of oestradiol when administered by injection, but which is 15 to 20 times more effective when given by mouth. Good results have been reported by one author with doses of between 0.5 and 4 mg., and by others with a daily dose of between 1.8 and 2.4 mg. for 3 days.

The results are reported in 68 patients in the puerperium whose babies had been stillborn or had died. In nearly all of them breast development was satisfactory or there was a history of previous successful lactation. In 22 patients varying doses were given to find the optimum amount. It was found that a total of 3 mg. was satisfactory; an initial dose of 0.6 mg. was followed by daily doses of 0.5, 0.5, 0.4, 0.4, 0.3, 0.2, and 0.1 mg. In 25 patients given this amount there were only 2 failures. Administration must be started within 48 hours of delivery. No other treatment is necessary, and tolerance is good.

The factor of suction was investigated in 7 patients; babies of mothers who had not received the drug were put to the breast of mothers who had been given the drug, but they obtained little milk, and no milk could be obtained by manual expression. In 14 other patients an electric extractor was used on several occasions with similar results; the largest amount obtained was 70 ml. in 1 day. The one failure in this series occurred in a case in which treatment was started only when milk secretion was profuse, and in which administration of the drug had to be discontinued on account of intolerance.

The authors consider that ethinyl-oestradiol is a satisfactory drug in 90 per cent of cases, when given early and in moderate doses, for preventing breast engorgement and milk secretion.

Bryan Williams

1890. Inhibition of Lactation by Male Sex Hormone. (Inhibition de la secrétion lactée par l'hormone mâle.)
By M. DUMONT. Rev. franç. Gyméc., 43, 213-

217, June 1948. 15 refs.

1891. Breast Reduction and Lactation. By A. RAGNELL. Brit. J. plast. Surg., 1, 99-103, July 1948. 3 figs., 1 ref.

#### THE INFANT.

1892. The Heart in Normal Infants and Children. Incidence of Precordial Systolic Murmurs and Fluoroscopic and Electrocardiographic Studies.

By N. Epstein. J. Pediat., 32, 39-45, Jan. 1948.

I fig., 12 refs.

This paper records the clinical, radiological, and electrocardiographic findings in a group of 260 presumably normal children, varying in age from birth to 14 years. Each child was examined at least 4 times a year, and the average duration of observation was about 5 years. Over 50 per cent of the children who were under 7 years of age had systolic murmurs, and a murmur was audible in 66 per cent of the children between the ages of 8 and 14 years. Radiological examination in the posterio-anterior position showed that the heart was normal in shape in all cases. In the right anterior oblique position none of the patients revealed evidence of enlargement of the left ventricle. On the other hand, in the left anterior oblique position - the angle of clearance of the left ventricle was 50 degrees + in 90 per cent of the children. No statistical differences were obtained by comparison of the electrocardiograms of children with and without murmurs at various age levels. In about 18 per cent of the patients there were sporadic electrocardiographic abnormalities. Jas. M. Smellie

1893. Resuscitation Unit în the Leonar Mendez de Barros Hospital for Mothers and Babies. (Servicio de reanimación de la casa maternal e da infancia "Leonor Mendez de Barros".)

By E. Mendoza, A. R. Martínez, and J. C. Soares Bicudo. Obstet. Ginec. lat.-amer., 5, 483-

488, Oct. 31, 1947. I fig., 18 refs.

A unit for the resuscitation of the newborn is described, together with the technique used and the results. The unit is next to the labour ward, and the table where the baby is resuscitated is warmed with electric bulbs, the degree of heat being adjustable. An Emerson apparatus for artificial respiration is used. Gentleness in the treatment of asphyxia in the newborn is essential, and violent methods such as those of Silvester and Schultz are avoided. In cases where cerebral haemorrhage is suspected the head is kept slightly raised, but in all others the head is kept below the level of the body, to allow mucus to drain from the respiratory passages. Endotracheal aspiration by means of a laryngoscope is carried out where possible, but otherwise the pharynx is cleared. Oxygen is insufflated, and the baby is subsequently placed in a Hess incubator. a-Lobeline is sometimes given, but is not considered essential.

In one year resuscitation was carried out 166 times in 3,232 deliveries. In 24 atonic babies the object of treatment was to prevent neonatal complications; the results were satisfactory in all. In 70 cases of slight asphyxia lasting less than 5 minutes there were 5 neonatal deaths; in 35 cases of moderate asphyxia lasting 5 to 10 minutes there were 6 neonatal deaths; and in 23 cases of severe asphyxia lasting more than 10 minutes there were 7 deaths during resuscitation and four deaths later; all the babies who died during resuscitation were found at necropsy to have lesions incompatible with life. In 5 cases resuscitation was attempted although there were no heart sounds at birth.

In all cases the treatment was started within I minute after delivery. In none of the babies who died after a few days were there any lesions which could be attributed to the Emerson apparatus. The highest incidence of asphyxiation occurred during delivery of the after-coming head. The authors conclude that every labour ward should possess a resuscitation unit. Their methods, which should, they consider, be employed even in cases of slight asphyxia, have been successful in 92.78 per cent of cases, with a final viability rate of 83.73 per cent.

Bryan Williams

1894. Congenital Esophageal Atresia and Tracheo-esophageal Fistula.

By C. G. Lyon and S. G. Johnson. J. thorac. surg., 17, 162-177, Apr. 1948. 2 figs., 9 refs.

In a recent review of the literature the authors have been able to find reports of 468 cases of oesophageal atresia with or without tracheooesophageal fistula. They tabulate and give diagrams of the types of anomaly reported in 3 large series of cases. They then report 4 cases upon which they operated at the University of California Intratracheal ether and oxygen was administered and the left transpleural approach was used in all 4 cases. The pleural space was entered through the bed of the fifth rib. The first patient was operated upon at the age of 60 hours. A blind upper oesophageal segment and a short blind lower segment were found, neither of them having a communication with the trachea. The diaphragm was opened and an oesophago-gastric anastomosis was made just above the level of the arch of the aorta after resecting the lower end of the oesophagus and a portion of the stomach. The child developed aspiration pneumonia from regurgitating a feed and died 48 hours after operation. necropsy, the anastomosis appeared viable.

The second patient was operated upon 120 hours after birth. A blind upper segment was encountered, and a lower segment having a fistulous communication with the trachea. The fistula was separated, ligated, and divided and an anastomosis made between the upper and lower segments of the oesophagus, after rotating the distal segment 180 degrees, as suggested by Gross. The child died

19½ hours afterwards of extensive bilateral pneumonia. The anastomosis admitted nothing larger than 2.5 mm. probe.

The third patient was operated on at the age of 88 hours. A blind upper ocsophageal segment and a lower segment communicating with the trachea were revealed. After separation of the fistula, the upper and lower segments were anastomosed endto-end. The postoperative course was complicated by a reopening of the tracheal fistula, and the development of a stricture at the site of anastomosis. In spite of dilatation of the stricture the patient died. Necropsy revealed a small abscess around the anastomosis, with re-opening of the tracheal fistula. In addition there was a second area of stenosis of the lower oesophageal segment 2 cm. distal to the fistula. The lungs showed bilateral pneumonia and atelectasis.

The fourth infant was operated on at 36 hours of age. Previous investigation with "lipiodol" had disclosed a blind upper oesophageal segment and a lower oesophageal segment, which communicated with the trachea. The oesophago-tracheal fistula was obliterated and the upper and lower oesophageal segments were united by end-to-end anastomosis. The child was discharged 23 days after entry in excellent condition. She takes fluid readily, but purces must be diluted, and dilatation may be required in the future.

In the 3 cases of end-to-end anastomosis a transverse opening was made in the most dependent portion of the upper ocsophageal segment and a longitudinal incision of comparable length in the lower segment. The segments were anastomosed with 2 rows of ooooo "deknatel" sutures. Interrupted sutures were used to approximate the mucosa, and mattress sutures to approximate the muscularis.

Hugh Reid

1895. A Simultaneous Abdominal and Perineal Approach in Operations for Imperforate Anus with Atresia of the Rectum and Rectosigmoid.

By J. E. RHOADS, R. L. PIPES, and J. PERLINGIERO RANDALL. Ann. Surg., 127, 552-556, Mar. 1948. 4 figs., 7 refs.

A one-stage abdomino-perineal operation is suggested for certain cases of imperforate anus in which the colon cannot be reached safely from the perineum. The operation is facilitated by preparing the skin of the entire baby from the axillae to the toes so that the two approaches can be used simultaneously. Two cases are reported, one child surviving 3 months, at which time he succumbed with uraemia, and the other surviving and healthy at 8 months of age.—[Authors' conclusions.]

1896. Acute Intussusception in Childhood. By B. Morrison and D. Courr. Brit. med. J., 1. 776-780, Apr. 24, 1948. 1 fig., 8 refs.

A careful study has been made of 100 children treated for acute intussusception over a 2-year

period in the Department of Child Health, Newcastle-upon-Tyne. Of these children 66 were seen by their own doctor within the first 24 hours, but only 34 were admitted to hospital within that period; in at least 17 cases, and probably in more—for the time interval was not known in all of them—the child was not admitted to hospital until after the end of the second day, and in some cases the delay was for as long as 7 days. The total fatality rate was 10 per cent, that for the children treated within the first 24 hours 5 per cent, and that for children treated after 48 hours 20 per cent or more.

Most children were between 3 and 9 months old, and 82 of the patients were under 1 year. Male preponderance was less in this than in some previous series, and the sex ratio was only 11:9. Most of the children were well-nourished, as in the series of previous authors, but precipitating factors did not bulk large in the series. Unwise dietetics could not be blamed in the majority of cases, and the actual process of weaning had been recently begun only in 29 per cent of cases. In 10 of the children a period of a few days' malaise preceded the intussusception and sometimes tended to obscure the diagnosis. A study of the actual clinical features bears out the accepted textbook picture of the disease, but vomiting was rather more frequent than it is commonly believed to be, occurring in 88 per cent. A tumour was felt in 88 per cent. It was considered that in previous series some deaths attributed to surgical intervention were, in fact, due to uncorrected circulatory failure. Special pains were therefore taken to transfuse adequately, 100 ml. of serum or plasma being given initially to a child under 9 months old, and 150 ml. to a child between 9 and 18 months old; saline was given later if required.

The treatment was in all cases operative. After studying the previous series in which enemata had been used alone or in combination with operation, the authors deduced that the success of enemata in these was due to the high proportion of early cases seen, rather than to any advantage which enemata have over operation. Comparing their series with the previous series of Hipsley, Nordentoft and Nyborg, all of whom advocated enemata, they see no reason to prefer enema administration to their present operative regimen. Ian Aird

1897. Acute Intussusception in Infancy and Childhood.

By W. M. DENNISON. Glasg. med. J., 29, 71-80, Mar. 1948. `15 refs.

This article describes the management of acute intussusception as practised by surgeons of one unit at the Royal Hospital for Sick Children, Glasgow; 237 patients have been treated over a period of 10 years and an analysis of these cases is presented. The author's views upon the treatment of the irreducible intussusception are of particular interest. In all, 14 such cases were treated, 9 by resection

with 5 deaths, and 5 by lateral anastomosis with 1 death. The successful outcome in 4 cases of simple lateral anastomosis without resection has suggested to the author that this method may be preferable to resection as a treatment in these cases. The author considers that death in cases of non-reduced intussusception is usually due to intestinal obstruction and that peritonitis is a rare cause of death. Although the intussusception may be gangrenous, the ensheathing layer is almost invariably viable. Therefore lateral anastomosis is a satisfactory procedure and the gangrenous inner layers are passed as a slough some days later.

C. G. Rob

1898. Clinical Statistics of Empyema in Infancy over a 15-Year Period (1931-47). (Considerazioni statistico-cliniche sulla pleurite purulenta dell'infanzia nel corso di un quindicennio (1931-1947).)

By U. GIURANNA and C. MELINO. Pediatria, 56,

48-63, Jan.-Mar. 1948. 5 figs., 33 refs.

In the years before sulphonamides were used, 1931–38, the incidence of empyema in the Paediatric Clinic of the University of Naples was 2.1 per cent. From 1938 to 1947 it was o.31 per cent, the actual number of cases being 580 out of 60,780. The incidence of empyema due to, broncho-pneumonia was 40 per cent up to 1938, and 14.9 per cent afterwards. This fall was parallel to the diminution in the number of cases of acute respiratory disease reported to the health authorities, from 55,000 in 1939 to 35,000 in 1946. The organisms chiefly responsible were pneumococci (77 per cent and 72.9 per cent), staphylococci and streptococci occurring much more rarely. The greatest incidence was in the second year of life; this was equally true of staphylococcal cases, an observation not recorded by other workers. The figures for streptococcal infections are too small to be significant. relative incidence of para-pneumonic and metapneumonic empyemas is unchanged, nor is the recovery rate much altered, being slightly greater in the later series in the para-pneumonic types— 67.7 per cent against 58.9 per cent. The rate in meta-pneumonic infections is approximately 78.0 per cent. The right and the left side were equally involved.

[This last statement is associated by the author with the figures for the incidence of bronchopneumonia in the right and left lungs, these figures also revealing an equal incidence. Presumably the definition of broncho-pneumonia is not the same as in Britain.]

1. G. Jamieson

1899. Penicillin Therapy in Infantile Empyema. (Ulteriore contributo alla terapia penicillinica nell'empiema pleurico dell'infanzia.)

By G. MURANO. Pediatria, 55, 563-591, July-

Sept. 1947. 17 figs., bibliography.

Attention is drawn to the greatly diminished morbidity from empyema in childhood from 1938

onwards, because of the use of sulphonamides in acute respiratory infections. Between the years 1932 and 1938 cases of empyeina formed 2.78 per cent of all admissions to the wards of the children's clinic in Naples, but only 1.44 per cent between 1940 and 1946; in the out-patient department, the incidence of empyema fell from 2.19 to 0.26 per cent. The mortality rate rose, however, because a greater proportion of cases were staphylococcal. Even with the use of penicillin the prognosis of infantile empyema is still not good, mainly because of the development of pleural thickening. The author records a series of 19 cases in detail, all treated with intrapleural and systemic penicillin. The pleural cavity was aspirated every 2 or 3 days and 15,000 to 30,000 units of penicillin were instilled; between aspirations 10 ml. of 10 per cent sodium taurocholate or 3 per cent quinine hydrochloride solution was injected in order to liquely the pus. It is claimed that the frequency of thoracotomy is thereby greatly reduced. Only in 3 cases was open drainage performed, pus was evacuated in one case; the other two merely had thickened and organized pleura. A third of the empyemata were staphylococcal, and 13 of the 19 patients were under 2 years of age. The average length of stay in hospital was 20 to 30 days instead of 2 months as formerly. Two children died, both of pyaemia, shortly after admission. Penicillin did not prevent the development of considerable pleural thickening, and the author suggests the use of intrapleural heparin as early as possible in treatment to prevent the deposition of fibrin.

E. G. Sita-Lumsden

1900. Suppurative Meningitis in the Newborn Due to Coliform Bacilli.

By K. J. RANDALL. J. clin. Path., 1, 150-155,

May 1948. 2 figs., 15 refs.

Although infrequent, suppurative meningitis in the first month of life is now more commonly recognized than formerly. This paper reports 6 cases of meningitis due to coliform bacilli. The ages of the infants ranged from 17 hours to 16 days and 2 of them were premature. The signs and symptoms are not typically those of meningitis; the temperature may be normal, but a sudden rise in temperature was an early sign in 4 of these cases. Other early signs are a failure to feed, restlessness, twitching of the limbs, and muscular spasms, but neck rigidity is rare. Convulsions often occur before death and a cephalic cry may develop. The author remarks that these signs are suggestive of an intracranial lesion or at any rate of cerebral anoxia, and urges an early examination of the cerebrospinal fluid. All these cases were due to Bacterium coli; a review of the literature shows this to be the commonest organism causing meningitis at this age. There is some evidence to suggest that the newborn may lack the normal coli agglutinins present in adults. In only one case was any specific treatment

(sulphathiazole) given; this was without effect. In one case the organism was sensitive to 100 units of penicillin per ml.

N. S. Alcock

1901. Etiological Aspects of Gastroenteritis. Parts I and II.

By E. HINDEN. Arch. Dis. Childh., 23, 27-39, Mar. 1948. I fig., bibliography.

A series of 148 cases of gastro-enteritis in infants were treated in the County Hospital, Kensington, in 24 months from April, 1938. The mortality rate was 44 per cent. The mortality rate in the 88 infants admitted with gastro-enteritis was 31 per cent and in the 60 who acquired it in hospital it was 63 per cent.

[Only two aspects of treatment are discussed—chemotherapy and the use of blood products. An important omission is a discussion of the common errors of nursery technique which invite epidemics of gastro-enteritis.]

R. S. Illingworth

1902. Intravenous Procaine in the Treatment of Toxnemic Syndromes in the Infant. (La novocaina endovenosa nel trattamento delle sindromi tossiche del lattante.)

By E. Soragni. Clin. pediat., Bologna, 30, 45-

54, Jan. 1948. 34 refs.

The author discusses the use of intravenous procaine in the treatment of 18 cases of gastro enteritis with toxaemia, in the University of Modena. One patient was 3 years old, while all the others were between 15 days and 12 months old. In 11 cases the cause was primarily intestinal, while in the remaining 7 cases there was a parenteral infection. In all cases there was diarrhoea, vomiting, dehydration, and a toxic facies, and in addition most children had albuminuria and pyrexia. The procaine (1 per cent solution) was injected into the longitudinal sinus or jugular vein in doses of 0.02 g., diluted in 10 to 20 ml. of hypertonic glucose or normal saline. The injection, which may be repeated up to 4 times in 24 hours, was given very slowly (1 to 2 minutes) and the dose was reduced to o.or g. in two of the smaller infants and increased to 0.025 g. in the child aged 3. Other treatment was also given (subcutaneous infusions, diet, chemo therapy). There were no toxic manifestations due to the drug.

In cases responding favourably there was almost immediate improvement of the toxaemic state. In 11 cases the result was a sudden "resuscitation" within 10 to 15 minutes. In 5 cases the result was good but not quite so dramatic, some evidence of toxaemia persisting. In 2 cases the condition hardly changed. The beneficial result was permanent in 10 cases. It lasted for a few days in 2 cases and only for a few hours in the remaining 6 cases. The final results were: 12 recoveries, 3 deaths among the intestinal group, and 3 deaths among the parenteral group. The author discusses the literature on the mechanism of the toxaemic syndrome,

stressing particularly neuro-vegetative and possibly endocrine factors, the action of histamme or histamine-like substances, and the consequent metabolic derangement. Procaine in vivo is split into diethylaminoethanol and p-aminobenzoic acid, which is active constituent. Procaine probably the presumably acts as an antihistamine drug and as an antagonist to acetylcholine (thus depressing the P. E. Polani parasympathetic.)

1903. Effect of Influenza Virus Vaccination in Infants and Children, with Antibody Studies.

By P. COHEN and H. SCHNECK. J. Pediat., 32,

161-169, Feb. 1948. 20 ress.

In this study the authors continue their previous investigation of the influenza antibody levels in the blood of children (Abstract 1904), and describe the use in 100 children of a vaccine of influenza viruses A and B adsorbed on calcium phosphate. The same technique of titration was used (erythrocyte agglutination-inhibition) and the sera taken before and after inoculation were tested at the same time, because of the variability from day to day of the titre strengths obtained by this method. The inoculations were performed on 100 children aged from 1 month to 18 years over a period of 6 months (October 1946 to March 1947) when an influenza epidemic was anticipated. Only 22 children received a second injection. Local and general reactions to inoculation were slight. The antibody levels were determined before inoculation, and after it at times varying from 6 days to 4 months. The titre rose significantly in the majority of cases over the whole group, the rise being greater in the children over 7 years. The following details illustrate this general statement. The titre-level of 64 is taken as that of "probable immunity" against influenza: before vaccination this immunity level was not reached in any children under 13 years, as regards either the A or the B virus strain: after vaccination, and in the case of the A virus (PR8), the level of 64 was reached in 5 out of the 18 children under 7 years, and in 17 out of the 22 over 7 years. In the case of the B virus (Lee strain), after inoculation the immunity level was reached in 2 out of the 18 under 7, and in 5 out of 22 children over 7 years old. An unequal rise in antibody levels against the two components of the vaccine was shown in some children; the effect of a second injection was studied, but in 5 cases there was no significant change. The authors are continuing their observations on this point, particularly in younger children whose natural supply of antibody is small.

The expected epidemic of influenza did not arrive. During the period of study there were 3 cases of influenza in the 100 inoculated children, and 19 cases in 200 control children. "Although the percentage of cases in the latter is over threefold that of the inoculated children, we feel that the significance of this is far from established in view of the absence of the study during a widespread epidemic involving a larger group of cases. Although our vaccinated group had a reduction in the attack rate, further studies are needed to prove conclusively the clinical efficiency of influenza vaccination in children, and no final conclusion regarding the protective effect of influenza vaccination in children can be drawn from this study ". C. McNeil

1904. Natural Incidence of Influenza Antibodies in Children of Different Age Groups.

By P. Cohen and H. Schneck. J. Pediat., 32,

154-160, Feb. 1948. 9 refs.

The authors have tried to ascertain the susceptibility of children to influenza by determining the levels in the blood of antibodies against influenza viruses at various ages in childhood. This was done in 13 newborn infants, in 9 infants aged from I to 16 months, and in 36 children from 2 to 7 years old. It is admitted that the numbers are small, but it is considered that the consistency of the results and their agreement with those reported elsewhere are significant. The sera were tested against two influenza viruses, the PR8 strain of A, and the Lee strain of B; it was found that the antibody titres at all ages were higher against the A virus than against B. In the case of the newborn infants, the titres were measured in the mothers' sera at the same time; the antibody levels were almost the same in mother and baby in every case, whether the titre was high or low. This result clearly indicated a passive transfer of immunity from the mother, and not an active immunity. This absence of an active and therefore lasting immunity against influenza in infants was shown by the great fall in the antibody levels in the next group of 9 infants (aged 1 to 16 months), the levels in every case being well below the protective minimum. In the third group, the titres remained low at the lower ages, but rose substantially after 5 years of age. This rise is explained by the development of active immunity after infection.

The authors' interpretation of these results is that infants and young children have no natural immunity against influenza (apart from a passive and very fleeting immunity at birth), and that they remain highly susceptible until immunity is developed as the result of clinical infection. They suggest that this susceptibility of young children to influenza might be controlled by prophylactic inoculation of influenza vaccine. C. McNeil

1905. Penicillin in Drops for Prophylaxis Against Ophthalmia Neonatorum. An Single Instillation Method.

By H. C. Franklin. Sth. med. J., 41, 320-325, Apr. 1948. 3 figs., 4 refs.

The author, at the John Gaston Hospital, Memphis, Tennessee, instilled 4 drops of penicillin (crystalline sodium salt, 2,500 units per ml. of

isotonic sodium chloride) into the eyes of 1,177 infants within an hour of birth, the lids and conjunctiva having been first thoroughly cleansed. He kept the infants under observation in hospital or at home until the seventeenth day. He found that 1.1 per cent developed conjunctival suppuration in hospital, and 2.9 per cent at home. This contrasts with 2.1 per cent when 4 drops were instilled singly over 3 days in an earlier series and with 6 per cent after silver nitrate prophylaxis in another series. The author points out, however, that 4 drops at once is an excessive dose; he also points out that infants in the earlier series were subject to the hazard of other infection, and that the earlier penicillin may have been less effective therapeutically. Of the organisms, two-thirds were staphylococci. There was no instance of gonococcal infection in the two penicillin series with a total of 2,138 cases. D. Matheson Mackay

1906. A Bacteriological Comparison of Penicillin and Silver Nitrate for Prophylaxis Against Ophthalmia Neonatorum.

By H. C. Franklin. Mil. Surg., 102, 179-185,

Mar. 1948. 3 refs.

The clinical effects of penicillin and silver nitrate used for prophylaxis of ophthalmia neonatorum have already been studied in 1,710 infants over a period of 7 months. This report covers the bacteriological findings in ocular lesions developing after each method of prophylaxis. Cultures were taken from those infants who had a purulent discharge from the eyes while in hospital, and also, when possible from those with purulent discharge at home during the first 2 weeks of life. Of the hospital patients 2.1 per cent had a purulent discharge after penicillin prophylaxis, and 80 per cent of the cultures were positive. Of the children examined at home 3.1 per cent had a discharge after penicillin prophylaxis, 93.3 per cent of the cultures being positive. After silver nitrate prophylaxis, 6 per cent of the hospital patients had purulent discharge with 37.8 per cent of positive cultures. Of the infants at home 2.4 per cent had a discharge, and 100 per cent of the cultures were positive. The gonococcus was found once after silver-nitrate prophylaxis, but never after penicillin prophylaxis. Falkland L. Cary

1907. Actiology, Clinical Features, Therapy and Prophylaxis of Infective and Septic Conditions in the Newborn Infant. [In Russian.]

By I. A. Stern. Akush. Ginek., No. 3, 27-32, May-June 1948.

1908. Further Observations on the Significance of the Blood Pyruvic Acid Level in Infancy.

By E. C. Allibone. Arch. Dis. Childh., 23,

7-16, Mar. 1948. 9 figs., 23 refs.

The complete metabolic breakdown of glucosc into carbon dioxide and water follows a sequence of stages which have been identified, in man, as

far as pyruvic acid; beyond that point the steps are not known, but they would appear to involve inorganic phosphate, metallic ions, manganese, magnesium and cobalt, protein, and one or more of the factors of the vitamin-B complex. An accumulation of pyruvic acid in the blood occurs in a variety of clinical conditions and might be caused either by retardation of its breakdown or by failure of re-synthesis to glucose. The author, who had previously shown that a raised level of pyruvic acid in the blood was to be expected in toxic and infective states even when thiamine intake was adequate, has now extended his investigations to: (1) the effect of giving massive doses of thiamine, both orally and parenterally, and (2) the fall in blood pyruvic acid which usually results when blood transfusions are given to infants suffering from haemolytic anaemia. After discussing his own findings and the reports and theories of other workers, he comes to the conclusion that the rise in blood pyrnvic acid in toxaemic and haemolytic states during infancy is not associated with a deficiency of thiamine and is probably unrelated to any of the known factors in the vitamin-B complex. N, B. Capon

1909. The Serum Cholesterol Level of the Prematurely Born Infant and its Mother.

By M. J. WHITELAW, J. clin. Invest., 27, 260-

262, Mar. 1948. 27 refs.

The serum cholesterol values of the immature infant are the same as those of the full-term infants. The absolute levels and partition of serum cholesterol do not vary with degree of prematurity. The cholesterol levels of mother and infant bear no relationship to each other. The free and ester fraction of cholesterol are found to be approximately 30 per cent and 70 per cent, respectively, in both the foetal and maternal serum. It is suggested that the low cholesterol value obtained in the serum of the prematurely born infant and term newborn may be due to the depressant action of oestrogenic hormones-[Author's summary.]

1910. Reliability of the Exclusion of Paternity after the MN and ABO Systems as Elucidated by 20,000 Mother-Child Examinations and its Significance to the Medicolegal Conclusion. [In English.]

By P. H. Andresen. Acta path. microbiol.

scand., 24, 545-553, 1947. 2 refs.

The blood groups of 20,000 mothers and their children have been determined during tests for exclusion of paternity at the University Institute of Forensic Medicine, Copenhagen. In none was any exception to accepted genetic rules demonstrated. The possible errors due to a non-demonstrated N2 or weak A factor are discussed. The general conclusion as quoted from the "Guidance in Judging of Blood-Typing Results " issued by the Institute is: " Blood typing belongs to the biological methods of examination . . . it may never attain

to absolute certainty. On the whole, however blood typing may be characterized as one of the most reliable biological methods employed in forensic medicine".

John F. Loutit

- 1911. Physiologic Icterus of the Newborn.

By A. Loewy and L. W. Freeman. Amer. J. Physiol., 152, 205-209, Jan. 1948. 1 fig., 17 refs.

The serum bilirubin content of blood aspirated from the umbilical cord of normal infants at normal deliveries and of blood withdrawn from the external jugular vein on the fifth day of extrauterine life has been determined by Evelyn's method (J. biol. Chem., 1937, 119, 481) in infants fed on breast milk, or a milk of standard formula containing: (1) 3.6 per cent fat; (2) 1.8 per cent fat; (3) 0.03 per cent fat; (4) 5.5 per cent fat. Fifty-one samples of cord blood had an average bilirubin content of 1.33 mg. per 100 ml. (range 0.13 to 5.22); after 5, days to infants in group (1) had an average of 5.41 mg. (range 0.366 to 13 114); 12 subjects in group (2) averaged 4.212 mg. (range 0.436 to 8.946); 9 subjects in group (3) averaged 3,093 mg. (range 0.825 to 9.552); 10 subjects in group (4) averaged 3.175 mg. bilirubin per 100 ml. (range 0.325 to 14.4). Of group (4) it is stated "that the diet was inadequately consumed and the figures cannot be considered representative of the true status on this diet ". It is suggested that approximately 50 per cent of the hyperbilirubinaemia of the newborn can be explained on the basis of haemolysis resulting C. C. N. Vass from the ingestion of fat.

1912. Physiological Jaundice of the Newborn. Some New Measurement of the Factors Concerned.

By P. L. Mollison. Lancet, 1, 513-515, April

3, 1948. I fig., 24 refs.

The author summarizes previous work which supports the theory that jaundice in the newborn is due to a functional immaturity of the liver. The excess of bilirubin formed in the first few days of life could be excreted by a liver of mature function

and jaundice would not appear.

The extent of postnatal haemolysis was studied. Blood from the placenta of a newborn infant was transfused into a second newborn infant, and the survival of the transfused erythrocytes estimated by the differential agglutination method of Ashby. As a control, erythrocytes from adults were transfused to other infants or occasionally to the same infant, and their survival was estimated. From observations extending to 80 or 90 days it was shown that the rate of breakdown of a newborn infant's own erythrocytes during the first 10 days of life is about twice that of the erythrocytes obtained from adults. When allowance is made for the relatively high mean corpuscular volume in the infant, it may be concluded that the production of bilirubin during the first 10 days is 3 times as great as in the adult. Nevertheless, this is not an amount which would produce in the adult the high

serum bilirubin levels which are encountered in the newborn. It is suggested that the acceleration rate of red cell destruction in the infant during the first 10 days is due to the less homogenous population of erythrocytes. The bulk of the erythrocytes have a survival time not much shorter than that of the erythrocytes obtained from an adult. The author also found that the rate of removal of bromsulphalein from the plasma of the newborn infant is strikingly lower than the rate c bserved in healthy adults.

Because the estimation may be affected by different rates of growth in different infants, the author is carrying out further experiments in which placental erythrocytes and adult erythrocytes are transfused to the same infant and their survivals are studied simultaneously.

J. B. Hannah

1913. Congenital Hemolytic Jaundice. The Pathogenesis of the "Hemolytic Crisis".

By P. A. OWREN. *Blood*, 3, 231-248, Mar. 1948. 16 figs., 21 refs.

Six cases showing all the criteria of congenital haemolytic jaundice were studied during crises. Jaundice decreased as the anaemia increased; the size of the spleen was unchanged. Severe anaemia developed, with granulocytopenia and thrombocytopenia, the reticulocytes disappeared, serum colour became normal, and the urobilinuria decreased. The marrow now showed aplasia of the red cell precursors. On about the ninth day of the crisis the pro-erythroblasts in the marrow began to regenerate, followed by increased erythropoesis until, on about the fourteenth day, the marrow was crowded with normoblasts and there was a marked reticulocytosis in the peripheral blood. A leucocytosis and increase in the platelets followed. with recovery from the anaemia. It is suggested that the anaemic crises are due to an acute aplasia of the marrow which, with the short life-span of the abnormal red cells present, produces the rapid anaemia. Marjorie Le Vay

1914. Congenital Haemolytic Anaemia and the Rh Factor. (La malattia emolitica congenita ed il fattore Rh.)

By R. GIUNTINI and G. PASQUINUCCI. Riv. Clin. pediat., 45, 746-763, Dec. 1947. Bibliography.

From the Paediatric Department of Florence University, the authors report 18 cases of congenital haemolytic disease, and comment on various features. The first case was studied in retrospect, since it occurred when no anti-Rh serum was available. The family history was typical of congenital haemolytic disease. The patient, born in 1938, had a history of kernicterus and residual signs of neurological damage. When the mother was tested in 1946 there was no incompatibility between her serum and the red cells of various donors and of her husband and children. She was given repeated injections of blood from her husband

and the affected child with production of anti-Rh agglutinins. Later the mother proved to be Rhnegative, while all the other members of this family were Rh-positive. Cases 2 to 5 do not present any exceptional features. .The authors comment on the persistence of agglutinins in high titre in the maternal blood after delivery. In cases 6 and 7 blocking antibodics were found in the mothers' blood and the babies were extremely ill. The authors find no correlation between the type of disease (icterus gravis or severe anaemia) and the type of antibody (complete or incomplete) present. The mother was Rh-positive in 7 of the 18 cases of congenital haemolytic disease here studied, a much higher proportion than the usual 5 to 10 per cent.

In cases 13 and 14 the mother was group O Rhpositive and father and children were group A Rh-positive. There was a high maternal titre of anti-A and anti-B agglutinins, a finding to which the authors feel that actiological significance should not be attached. In most of the cases in which the mother was Rh-positive, the authors consider the possibility of sensitization to subgroups of the Rh-group, not detectable by routine testing with

anti-Rha (anti-D) serum.

Family 17 is very interesting. The second pregnancy resulted in the birth of twins, one of whom developed icterus gravis and kernicterus, while the other remained well. Mother, father, and both twins were group A Rh-positive. In family 18 the mother was group A Rh-positive, and the child, with a history and signs of kernicterus, was group O Rh-positive. An attempt was made to produce antibodies in the mother by injections of filial blood, but without any success. This, according to the authors, excludes blood incompatibility and sensitization between mother and child.

The treatment employed by the authors consisted mostly in blood transfusions, repeated whereever necessary. The blood was given in amounts of 80 to 100 ml. or less at a time, and 7 babies were treated in this way. The blood employed was Rh-negative but on occasions Rh-positive blood had to be given without any apparent ill effects. The results of treatment were good.

P. E. Polani

1915. Hematologic Studies on Children of Rh-Negative Women Compared to those of Rh-Positive Women.

By E. L. POTTER and H. E. BERNSTEIN. J.

Pediat., 32, 246-250, Mar. 1948.

It has been suggested that mild degrees of anaemia in infants may be due to Rh or A-B incompatibility. The authors have investigated 244 apparently normal infants from this point of view, and have studied haemoglobin values, and erythrocyte, leucocyte, and differential counts on the first and eighth days of life. When the results were classified according to the compatibility of the A-B

and Rh factors of the mother and child, no haematological differences were demonstrable between those in which the infant's blood was compatible with that of the mother and those in which it was incompatible. Both groups were combined to give normal mean values.

\*\*Doreen Daley\*\*

1916. Studies on the Conglutination Test in Erythroblastosis Fetalis.

By A. S. WIENER and E. B. GORDON. J. Lab. clin. Med., 33, 181-188, Feb. 1948. 18 refs.

Live sera from sensitized Rh-negative women were studied to discover which of 5 techniques was most sensitive and satisfactory. The blocking test was least sensitive, being negative in 2 out of 7 samples which did not contain complete (agglutinating) antibody; the plasma conglutinin and antiglobulin (the indirect Coombs test) methods were 7 to 20 times more sensitive, and positive in all 9 sera. The albumin-plasma method was most sensitive, being about 30 times more sensitive than the blocking test.

To discover the best methods of demonstrating sensitization of the infant's red cells in cord blood, a study was made of Rh-positive infants born to 11 Rh-negative women with incomplete Rh antibodies (titre 1 to 1,400 by albumin-plasma technique), to 8 women with complete antibodies (titres 1 to 42), to 4 unsensitized Rh-negative women, and of 3 Rhnegative infants born to sensitized Rh-negative mothers. If incomplete antibodies are present, the cells of cord blood are usually coated with antibody so that they are not agglutinated by agglutinating anti-Rh, (anti-D) serum, but are agglutinated by adult plasma or albumin-plasma (8 of 11); the direct Coombs test is positive (5 of 5 cases tested); the infant's serum contains antibodies detectable by the albumin-plasma technique (8 to 9), and the icterus index of cord serum exceeds 14 units. If complete antibodies are present in the mother's blood, sensitization of infant's cells is rarer (4 of 8), and in only one case was antibody detected in the cord serum; the icterus index exceeds 12 units. If blocking antibodies are present in mother's serum as a result of sensitization by a previous pregnancy or transfusion, and the infant is Rh-negative, then the cord serum has a titre identical with that of maternal serum; but if complete antibody is present in maternal serum it does not appear in cord scrum. In these, and other unaffected infants, the icterus index does not exceed 14 units.

It is concluded that incomplete antibodies readily pass across the placental barrier, but that complete (agglutinating) antibodies do not, unless there is a defect in the placental barrier or breakdown during labour. The occasional failure of the albumin-plasma technique to demonstrate coating with incomplete antibody of infants' Rh-positive cells is explained by the hypothesis that infant's plasma may contain a conglutinoid, which is absorbed by sensitized cells, but fails to agglutinate

them, though preventing the action of adult conglutinin added later; the difference between conglutinin and conglutinoid is analogous to that between complete and incomplete antibody, or complement and complementoid. When maternal serum contains blocking antibodies, the severity of the disease in erythroblastotic infants is roughly proportional to the titre of the antibody.

G. Discombe

1917. How Important is Transfusion as a Cause of Haemolytic Disease of the Newborn?

By G. DISCOMBE and H. O. HUGHES. Brit. med. J., 2, 329-330, Aug. 14, 1948. 12 refs.

1918. Erythroblastosis Foetalis and the Rh Factor. (Die foetale Erythroblastose und der Rh-Faktor.)

By A. Gyongyossy. Gynaecologia, Basel, 126, 21-32, July, 1948. 2 figs., 6 refs.

1919. Therapy of Severe Erythroblastosis Fetalis with Repeated and Massive Exchange Transfusions.

By A. S. Wiener, I. B. Wexler, and A. Shul-Man. Amer. J. clin. Path., 18, 141-151, Feb., 1948.

25·refs.

The purpose of this paper is to describe a modification in the authors' method of treating erythroblastosis foetalis by exchange transfusion, and to report successful results in 2 difficult cases. After a discussion of the advantages of exchange transfusion over other forms of treatment in preventing the clumping of red cells in vivo, which is responsible for the more serious manifestations of erythroblastosis foetalis, the management of the 2 cases is described in detail. If the radial artery is used for the withdrawal of blood and the saphenous vein for the infusion, 1,000 ml. of blood can be given to an infant within 90 minutes, thus attaining an exchange of approximately 98 per cent of the infant's red cells. For technical details and for information concerning the antenatal blood tests recommended, the original paper should be consulted.] In the 2 cases reported the pregnancies were terminated prematurely by Caesarean section. In the first case an exchange transfusion of 500 ml. of blood was given but, since progressive manifestations of the disease continued, the exchange transfusion was repeated on the following day, when the disease was arrested and recovery followed. In the second case, in an infant weighing only 41/2 lb. (2 kg.), 1,000 ml. of blood were infused and 950 ml. removed. Jaundice developed but cleared within a fortnight, and no signs of toxicity were seen.

L. J. Davis

1920. Exsanguinating Transfusion in the Treatment of Erythroblastosis Foetalis. (Exsanguinačí transfuse pri léčení fetální erythroblastosy.)

By K. RASKA and A. BERNARD. Cas. Lék. ces.,

86, 1517-1521, Dec. 22, 1947. 4 refs.

Three cases of erythroblastosis foetalis were successfully treated by exsanguinating transfusion.

The Rh-positive blood of the patients was withdrawn from the radial artery and replaced by Rh-negative donor blood through the saphenous vein or the cubital vein with a 10-ml. syringe. Neither citrate nor heparin was added. Some 380 to 430 ml. of Rh-positive blood was withdrawn and 450 to 590 ml. of Rh-negative blood transfused. In one baby the treatment was repeated within 48 hours of birth. Here, 470 ml. Rh-positive blood was withdrawn and 880 ml. of Rh-negative blood given. The Rh-negative blood cells survived for 75 to 80 days. Breast-feeding was started when the Rh antibodies had disappeared from the breast milk (12 to 14 days after birth). No sequelae were observed. The indication for this treatment is the presence of clinical signs of the disease in the newborn, or of Rh antibodies in its serum or in the cord blood. During pregnancy repeated serological controls in suspected cases will facilitate early diagnosis. Where a high or rising antibody titre is found the induction of labour 2 to 3 weeks before term is advised. M. Dynski-Klein

1921. The Economics of Infant and Child Nutrition. By N. B. TALBOT, W. W. PICK, and S. L. WELLS. New Engl. J. Med., 239, 79-82, July 15, 1948. 14 refs.

1922. Formula Rooms For Newborn Infants in Lying-in Hospitals. A Preliminary Study on Supervision and Certain Technics for Preparation.

By H. M. WALLACE, H. ABRAMSON, and M. A. LOSTY. *Pediatrics*, 1, 758-766, June, 1948. 21 refs.

1923. Some Observations on the Feeding of Premature Infants Based on Twenty Years' Experience at the New Haven Hospital.

By G. F. Powers. Pediatrics, 1, 145-158, Feb.,

1948. 4 figs., 27 refs.

The author discusses various infant dietaries, and points out how his studies of them 20 years ago led him to use as a routine for all infants not breast-fed an artificial feed relatively high in protein, carbohydrate, and minerals, and low in fat. This was obtained by using a mixture of whole and skimmed dried milks in the proportion of 7 to 5 with 10 per cent "dextrimaltose" added, giving the following percentage distribution of calories—protein 16 per cent, carbohydrate 66 per cent, and fat 18 per cent.

Premature infants also received this artificial formula when breast milk was not available and were found to thrive better, as judged by growth and freedom from digestive disturbances, than those on human milk. The rate of gain in weight was studied during the third week of life in 41 infants weighing under 2,250 g. Only infants receiving less than 120 calories per kilo body weight per day were included. Comparison of the 24 infants weighing 1,800 to 2,199 g. at birth showed that those on human milk gained an average of 8.4 g. per kilo per day, while those on the half-

skimmed milk gained on an average 11.9 g. per kilo per day, this difference being statistically significant. Thus human milk, which is satisfactory for the full-term infant, is not necessarily the ideal for the premature infant during the first few weeks of life. Reinforcement of breast milk with some form of protein may render it more suitable, and references are made to recent work in this field. Emphasis is laid on the poor absorption of fat in premature infants, whether fed on human or cow's milk, with consequent loss of calories in the stools when the diet is high in fat. A plea is put forward that the analysis of infants' diets should be expressed as a percentage of total calories obtained from protein, fat, and carbohydrate, this being a more intelligible method, as the analysis is in terms of the unit of metabolism—the calorie.

The mortality rates for the past 23 years are cited; no striking change has occurred, nor have any important changes in any of the age groups been noted during the last 13 years. The survival rates for premature infants fed on a half-skimmed milk mixture are as favourable as those reported from other clinics. However, qualitative differences in foods are unlikely to be reflected in the mortality rates for infants during the first days or possibly weeks of life.

P. Poyner-Wall

1924. Foetal Mortality in Labour (Zur kindlichen Mortalitat sub partu.)

By U. von Rutte. Gynaecologia, Basel, 125, 29-36, Jan.-Feb., 1948. 5 figs.

In this statistical review of 45,465 births at the Women's Clinic of the University of Basle the average combined stillbirth and neonatal death rate (10 days after delivery) was 3.4 per cent, varying between figures of 5.5 per cent for 1926 and 1.8 per cent for 1924. When the average figures for any 3 successive years are taken there is a 40 per cent improvement for the years 1941, 1942, and 1943 over the average for the first 3 years under review. The decrease in rates for intrauterine death and neonatal death is not so marked as the decrease in the rate for deaths occurring during actual delivery from 1.6 to 0.7 per cent. This is attributed to earlier and more frequent resort to Caesarean section for foetal indications and improvement in technique of breech delivery. Mortality for breech delivery dropped from 6.5 to 2.7 per cent, mortality for forceps deliveries from 10 to 1.4 per cent. The incidence of Caesarean section has risen from 1.2 to 3.6 per cent, and the infant mortality has dropped Elliof E. Philipp from 16 to 3.4 per cent.

1925. Stillbirth from the Obstetric and Legal Standpoints. (El nacido muerto desde el punto de vista obstetrico y legal.)

By J. M. Moncanut. Toko-ginec. pract., 7, 305-328, June, 1948. 6 refs.

# MATERNAL MORBIDITY AND MORTALITY.

1926. Some Considerations on the Classification of Disease after Confinement. [In Russian.]

By L. I. Bublichenko. Akush. Ginek., No. 3, 25-27, May-June, 1948.

1927. The Use of the Recovery Room in Lowering Maternal Mortality.

By L. F. McLean, H. C. McDowell, and M. G. Sadugor. N.Y. St. J. Med., 48, 1368-1370, June 15, 1948.

## OBSTETRIC OPERATIONS.

1928. Amniotic Puncture and Amniography. (La ponction de l'amnios et l'amniographie.)

By L. Portes and A. Granjon. Gynéc, et

Obstét., 47, 42-48, 1948. 4 figs., 3 refs.

The authors consider that abdominal amniotic puncture is a safe obstetrical procedure, too little known in France. They use a spinal puncture needle with an attached Claude manometer. In cases of acute hydramnios accompanying monovular twin pregnancy they repeatedly remove amniotic fluid in this way. In cases of retention of a dead foetus they inject 300 to 600 ml. of "serum" [the composition of which is not specified] in order to induce labour. These authors have also injected "serum" as a means of inducing therapeutic abortion by causing intra-ovular hypertension, but with less success. They have used amniography, after injection of aqueous iodide solutions (20 to 40 per cent) diluted in serum, to study the effects of oxytocics in cases of death of the foetus, to locate the placenta, and to diagnose foetal abnormalities. Since the injected fluid is excreted, pyclocystography may also be carried out. H. Godar

1929. The Present Technique of Lower-Segment Caesarean Section in Potentially Infected Cases at the Obstetric Clinic, Lyons. (La technique actuelle de la césarienne basse dans les cas impurs à la clinique obstétricale de Lyon.)

By P. TRILLAT, R. BURTHIAULT, and —. CHARVET. Rev. franç. Gynéc., 43, 249-252, June 1948.

1930. A Technique to Reduce Blood Loss during Cesarean Section.

By F. M. Dula. North Carolina med. J., 9, 291-292, June, 1948.

1931. A Statistical Review of Two Hundred and Forty-one Consecutive Cesarean Sections.

By T. W. Adams. West. J. Surg. Obstet. Gynec., 56, 243-249, Apr., 1948.

1932. A Rare Indication for Cesarean Section: Thrombotic Varicosities in the Vagina. [In English.] By K. SOIVA. Acta obstet. gynec. scand., 28, 77-85, 1948. 27 refs.

1933. Extraperitoneal Cesarean Section for the Infected Case with a Review of Cesarean Deaths in Jefferson County over a 16-year Period, 1931-1946.

By B. Word. J. med. Ass. Alabama, 17, 193-301, Mar., 1948. 9 figs., 35 refs.

1934. The Use of Local Anesthesia in Cesarean Section.

By J. F. Mohan. Cincinnati J. Med., 29, 335-337, June, 1948.

1935. The Technique of Craniotomy with the High Lying Head. [In Russian.]

By N. A. TSAVYANOV. Akush. Ginek., No. 3, 21-24, May-June 1948.

#### MISCELLANEOUS.

1936. The Conditioning of the Human Fetus in Utero.

By D. K. Spelt. J. exp. Psychol., 38, 338-346, June, 1948. 2 figs., 16 refs.

1937. The Obstetrician and Gynaecologist as a Witness in the Courts.

By A. L. McIlroy. *Med.-leg. J.*, **16**, 58-66, 1948.

#### GYNAECOLOGY.

General.

1938. Behaviour of the Skin Capillaries in Stilboestrol Therapy. (Sul comportamento dei capillari cutanei durante la terapia stilbenica.) (Ricerche capillaroscopiche.)

By G. Montanari and G. Spadea. Ann. ital. Chir., 24, 591-599, Nov.-Dec., 1947. 3 figs., 9 refs.

The nail folds of the fingers of 10 patients taking stilboestrol were examined with a capillaroscope. Seven of these patients had carcinoma of the breast, I had carcinoma of the uterus, and 2 had Buerger's disease. The capillary loops were increased in number per field, and appeared to be lengthened and widened, and of deeper colour. These changes were more marked in the women than in the 2 men. The changes occurred quite soon after the start of treatment; they reached a maximum in about 12 days and regressed after cessation of treatment.

Tom Rowntree

Disorders of Function.

1939. General Concept and Nomenclature of Menstrual Disturbances. (Concepto general y nomenclatura de las alteraciones de la menstruacion.)

By M. USANDIZAGA. Toko-ginec. pract., 7, 263-303, June, 1948. Bibliography.

1940. Investigations on the Origin of Hypomenorrhoea. (Untersuchungen über die Entstehung der Hypomenorrhoe.)

By F. HOFFMANN. Zbl. Gynäk., 69, 1052-1057. 1947. 3 figs., 5 refs.

Twenty-three patients whose genital organs appeared normal on clinical examination but whose menstrual periods, occurring at intervals of from 26 to 30 days, lasted for not longer than 24 hours and were scanty, were investigated at the Gynae-cological Clinic of Berlin University and the Huyssens Memorial Hospital, Essen. One patient with tuberculous endometritis was excluded; in 2 women endometrial biopsy was performed a few days after cessation of the period, and in the remaining 20 patients 35 endometrial biopsies were carried out, partly at the end of the proliferative phase, partly at the end of the secretory phase before the period started, and also in the first few days after menstruation.

The histological picture before the period was normal in all cases, in both the proliferative and the secretory phases. Biopsy, performed I to 2 days after cessation of the short and scanty menstrual period, showed that only a thin superficial layer of the endometrium had been shed and that the remaining, rather high, mucous membrane was still in the secretory phase; frequently glycogen was demonstrable by Best's method in the glandular cells and lumina. Between the third and fifth days of the cycle, rapid regression of the endometrium took place, with diminution of the oedema of the stroma and narrowing of the glandular lumina, and gradual transition to the proliferative phase. Abnormally slow fall of the progesterone level may be responsible for this atypical variety of menstruation. N. Alders

1941. Causes of Functional Amenorrhoea. (Uber 'die Ursachen der funktionellen Amenorrhoe.)

By F. V. Mikulicz-Radecki. Zbl. Gynäk., 69, 1046-1052, 1947.

Because of the recent increase of cases of functional amenorrhoea, the author has studied the cases of 96 women (private patients in Bonn) with amenorrhoea, 55 of whom were not pregnant. He concludes that functional amenorrhoea has recently occurred in Germany not only in patients with labile menstrual cycles, infantilism, or a preclimacteric state, but also in hitherto perfectly healthy women. The reason for this is prolonged physical and mental exhaustion, during which function of the genital organs is suspended, frequently only after exhaustion has been present for a considerable time. The immediate cause of the amenorrhoea is ovarian insufficiency; either the Graafian follicle fails to rupture, through lack of corpus luteum hormone (the size of the uterus remaining normal), or the follicle fails to mature, through lack of follicular hormone as well (the uterus, being hypoplastic). While sudden fright or fear of pregnancy may occasionally be responsible for functional amenorrhoea, there has been physical exhaustion of some duration. N. Alders

1942. Presacral Neurectomy for Dysmenorrhea. By F. M. INGERSOLL and J. V. Meigs. New Engl. J. Med., 238, 357-360, March 11, 1948. 10 refs.

This paper is an analysis of the results of presacral neurectomy in III cases of dysmenorrhoea. Other procedures, such as dilatation and curettage or suspension operations, were usually carried out at the same time. The cases are divided into two classes: (I) essential dysmenorrhoea, with severe spasmodic pains coming on soon after the menarche and without physical signs; and (2) acquired dysmenorrhoea, resulting from a demonstrable pathological process (Table 2). Table I gives the results obtained in these 2 classes. A much higher proportion of patients with essential dysmenorrhoea were completely cured, the respective figures being 81 per cent and 52.6 per cent.

TABLE 1
Results of Presacral Neurectomy

Result*	Patients with Essential Dysmenorrhoea	Patients with Acquired Dysmenorrhoca	
Complete relief Partial relief Failure		10 (52.6%) 4 (21%) 5 (26.4%)	
Totals	89	19	

\* There was no follow up study in 3 cases.

TABLE 11
Actiology in Patients with
Acquired Dysmenorrhoea

Cause	No. of Cases
Pelvic inflammation	4 7 5 3
Total	19

There were no deaths in this series, but there were 2 cases of post-operative obstruction of the small intestine requiring laparotomy. In r case there was severe haemorrhage during the operation due to damage to the left iliac vein.

The causes of failure of presacral neurectomy are examined in detail. In 12 cases the possible causes were psychoneurosis (3 cases), regeneration of nerves (2 cases), and incomplete sympathectomy (7 cases). The oestrogen test was found useful in eliminating the psychoneurotic group. Ovulation is prevented by administration of oestrogens for 20 days; in normal women a painless withdrawal bleeding occurs 2 to 8 days later, but in some cases even

this type of bleeding is painful, revealing a psychoneurotic tendency, which contra-indicates operation. The test was carried out in 35 patients on whom a neurectomy was performed later; 32 had painless anovular bleeding and of these 27 were relieved by the operation; 3 had painful anovular bleeding, and obtained no relief. Regeneration of the nerves is a rare cause of failure. In such a case operation appears to be a success, but after several months or even years the dysmenorrhoea returns. Sympathetic fibres may be missed at operation in 2 places; the branches from the fourth lumbar ganglion may pass deep to the arteries instead of anterior to them; or the large trunk, which in some cases runs near to the inferior mesenteric vessels, may be retracted far laterally if the sigmoid has a free mesentery, and thus escape dissection.

After presacral neurectomy 24 patients had children. Of these, 8 patients had almost complete freedom from pain during the first stage of labour, but dilatation of the perineum caused pain in every case. Presacral neurectomy acts by breaking the referred-pain arc, which consists of the presacral nerve, the cord, and the corresponding sensory nerves. Afferents from the fundus are believed to pass to the eleventh and twelfth dorsal segments, afferents from the cervix to the first lumbar segment. In 7 cases pain was relieved except for low backache; it may be, therefore, that in some cases afferents from the cervix pass to the cord by another route, perhaps with the parasympathetic fibres to the second, third, and fourth sacral segments. This is supported by Meigs's finding that passage of a sound through the cervix is still painful after neurectomy, although endometrial curettage is painless. Tiny areas of endometriosis were found in 11 per cent of the cases of essential dysmenorrhoea (average age 24 years), showing that this condition may start very early in life. In 3 dated dysmenorrhoea acquired cases appendicectomy. No reason for the pain was found at operation, and it was completely relieved Margaret Puxon by presacral neurectomy.

1943. On Intra-abdominal Haemorrhage Originating from the Female Sex Organs. (Nói ivarszervi eredetű hasűri vérzések különleges okairól.)

By M. Acs. Orv. Lapja, 4, 464-468, Apr. 4, 1948. 4 figs., 9 refs.

1944. Uterine Haemorrhage. (Hemorragia uterina disfuncional.)

By R. PECORONE. Rev. méd. Rosario, 38, 363-385, June 1948. 6 refs.

1945. Atypical Menstrual Bleeding in Abnormal Conditions of Life. (Atypische Regelblutungen bei abnormen Lebensbedingungen der Frau.)

B. F. SPACKMANN. Zbl. Gynäk., 69, 1077-1085,

1947. 4 figs., 14 refs.

Comparison of 46 cases of functional menorrhagia and metrorrhagia necessitating curettage in women

between the ages of 20 and 39, seen at the Gynaecological Clinic of Königsberg University in 1937 and 1938, with 65 similar cases observed during 1942-3, showed an increase in such cases almost entirely among women between the ages of 20 and 29. The curettings of 88 of these patients were examined histologically; in 18 per cent the histological picture was normal. In the remaining cases the following abnormalities were detected: congestion of the proliferating mucous membrane (II per cent), irregularity of the proliferating endometrium (8 per cent), endometrial hyperplasia (35 per cent), retarded shedding of the mucous membrane (7 per cent), irregular shedding of the endometrium (11 per cent), congestion during the secretory phase, irregularity of the secreting endometrium, and hyperplasia during the secretory phase. The author believes that these abnormalities were due to worry and excessive physical exertion, though a proportion of his patients were "cyclelabile". Curettage, followed by application of a 5 per cent formalin solution to the uterine mucous membrane generally cured the atypical bleeding. N. Alders

1946. Rupture of the Vaginal Vault during Coitus. By A. W. DIDDLE. West. J. Surg. Obstet. Gynec., 56, 414-416, July 1948. 36 refs.

1947. Vaginal Lacerations due to Coitus. (Lacerazioni vaginali da coito.)

By T. Nobile. *Ginecologia*, *Torino*, 14, 172-184, Apr. 1948. 18 refs.

1948. Dyspareunia: A Problem for the General Practitioner.

By R. T. Frank. J. Amer. med. Ass., 136, 361-

365, Feb. 7, 1948. 9 refs.

Dyspareunia is a common symptom and responsible for much unhappiness. The family doctor is usually the first to be consulted, but often is ill qualified to give advice. In the hope of providing relevant information for the guidance of practitioners, the author reviewed the case records of 349 private patients who had consulted him because of dyspareunia. This represented 1.5 per cent of the patients he had seen over a selected period; 105 patients (29.6 per cent) complained only of dyspareunia, 165 (47.7 per cent) gave it as their main complaint, and 79 (22.7 per cent) mentioned it incidentally. Although 193 (55.3 per cent) had never conceived, only 39 complained of sterility. In 114 patients the dyspareunia had been present since marriage, and the author believes that the seriousness of dyspareunia is proportional to the length of time it has existed. Local introital causes were abnormalities and lacerations of the hymen and inflammatory lesions, all of which responded to local treatment. In 7 cases a congenital septum required excision. Seventy patients complained of an acquired dyspareunia due to introital causes of which the commonest was stenosis

perineorrhaphies and episiotomies. This stenosis was present in 46 patients, while 23 had menopausal involution.

Deep dyspareunia was due chiefly to retroflexion with associated ovarian prolapse and to pelvic inflammation. The former condition was treated by daily assumption of the knee-chest position and by the insertion of a Hodge pessary. In inflammatory conditions the underlying lesion was treated by chemotherapy, rest, and diathermy. Less common causes of deep dyspareunia were the excessive use of contraceptive diaphragms with resultant trauma to the utero-sacral ligaments, and endometriosis of the pouch of Douglas.

When both introital and deep dyspareunia were complained of the usual cause was inflammation. Sixty-three patients (17.5 per cent) had normal pelves and in 24.6 per cent of the total series the cause was psychogenic. In these the dyspareunia is a defence mechanism, and investigation of 36 husbands revealed such male causes of disharmony as impotence, excessive coitus, premature ejaculation, and lack of sympathy. In these cases the co-operation of the husband should be sought and the handling of the patient herself demands tact and kindliness. At the first interview coitus is forbidden, twin beds are advised, and hot sitz baths and sedatives are prescribed. At the next interview, approximately a week later, the patient is instructed in the insertion of lubricated "pyrex" vaginal tubes of  $\frac{5}{6}$  in. and 1 in. (1.5 and 2.5 cm.) diameter. When the patient can insert the smaller tube herself she is instructed to do this for 10 minutes twice daily by the clock for I week. The larger tube is used in the second week. The results of this treatment have been excellent. I. Stallworthy

1949. Hymenovestibulitis localis. A Frequent But Disregarded Cause of Dyspareunia. [In English.]

By J. G. H. Holt. Gynaecologia, Basel, 126, 39-42, July 1948. 2 figs.

1950. An Evaluation of Infertility Factors.

E. W. OVERSTREET. Calif. Med., 69, 32-36, July 1948. 15 refs.

1951. The Sterile Marriage. (A meddó házasság.) By B. GYULAI. Orv. Lapja, 4, 425–429, Mar. 28, 1948.

1952. Neuro-endocrine and Psychodynamic Factors in Sterility.

By H. B. FRIEDGOOD. West. J. Surg. Obstet. Gynec., 56, 391-398, July 1948.

1953. A Survey of 754 Cases of Sterility Treated between 1940 and 1946.

By W. WEINBERG. S. Afr. med. J., 22, 5-18, Jan. 10, 1948. 2 figs., 16 refs.

The author considers that sterility exists if a couple have been married for at least 2 years and no contraceptives have been employed for at least

I year. Cases of absolute sterility, cases of relative sterility (one child born from either the present or a previous marriage), and cases of previous abortion are included.

The male with subnormal semen is referred to the urologist; cases have been treated by androsterone injections over periods of up to 6 months, and other patients have been given dry thyroid. Conception has been noted, however, when the husband's sperm count has not exceeded 10,000,000 per ml.

In the examination of the female, a sound is passed to exclude spasm of the internal os. Where this is encountered, the cervix is dilated to No. 5 Hegar without anaesthesia. Cervical crosions are treated by application of iodized phenol, "negatan", and 2 per cent aqueous mercurochrome in turn, several times if necessary. Surgical diathermy is not thought to accelerate healing. Coincident trichomonas infections are considered to delay the healing of erosions and are treated by application of 3 per cent hydrogen peroxide and 2 per cent gentian violet, insufflation with an acetarsol powder, and insertion of "floraquine" tablets twice daily. Retroflexion of the uterus is corrected and a Hodge pessary inserted; where correction is not possible Gilliam's operation is performed. Air insufflation is carried out within I week of the end of the period, and is repeated twice if the result indicates tubal blockage, spasm, or stenosis. Auscultation of the abdomen and the complaint of shoulder pain are used to assess tubal patency, as well as the manometric readings. Lipiodol hysterosalpingography is performed if 3 air insufflations have given negative results. Where the tubes are not patent short-wave pelvic diathermy is administered twice weekly (except during the week of the period), and air insufflation is repeated twice monthly over a period of 6 months; in many such cases patency was re-established.

Morning oral temperature is recorded over a 2month period to detect ovulation. Endometrial biopsy is performed on the first day of men-Where repeated biopsy shows that menstruation is anovular, cases have been treated by injections of "synapoidin" (follicle-stimulating and luteinizing hormones) on the fourth, sixth, eighth, tenth, and twelfth days of the cycle. Other cases have been treated by injection of gonadotrophins, or oestrogens and progesterone. The Huhner post-coital test and Miller-Kurzrok lytic test are also carried out. Where there is a history of previous abortion comp'ete abstinence from intercourse and adequate rest are advised during pregnancy. Vitamin E, 50 mg. twice daily and oral progesterone, 10 mg. daily, are given until the ninth

Of 754 cases of sterility, 563 were absolute and 191 relative. The average age of the female was 31 years; the average duration of marriage before treatment was 7 years, and the average duration

of attempts to bring about conception 6.1 years. There was a history of previous abortion in 150 cases. In 42 cases (5.5 per cent) both male and female partners were found to be at fault. There were 9 subsequent pregnancies (21 per cent). In 63 cases the male was at fault (8.3 per cent). There were only 11 subsequent pregnancies (17 per cent). In 733 cases the female was considered to be at fault (97.2 per cent). The fault was tubal in 445 cases (61 per cent). Treatment resulted in 293 subsequent pregnancies (66 per cent successful). Nine cases of tubal block were treated by salpingostomy, with 3 subsequent pregnancies. There were 97 cases of anovular menstruation (13 per cent), repeated endometrial biopsy showing no evidence of luteinization; 78 cases were treated by endocrine therapy, with 60 subsequent pregnancies (62 per cent successful). In 413 cases (56.3 per cent) the fault was considered to be "uterine". There were 47 cases of retroflexion of the uterus; 33 were treated by replacement and insertion of a pessary, and 14 by Gilliam's operation; 35 patients became pregnant (75 per cent successful). Ovarian tumours and fibroids were found in 68 cases; 28 cases were treated conservatively and 40 by operation, including 14 by myomectomy. There were 39 pregnancies (57 per cent successful). "Infected cervical mucus" was treated in 54 cases, with 47 subsequent pregnancies (88 per cent successful).

Artificial insemination with the husband's semen was employed in 21 cases. On the average 16 inseminations over a period of 7½ months were made. There were 11 pregnancies, including 2 cases of twin pregnancy (52 per cent successful). In the whole series of 754 cases there were 400 pregnancies (53 per cent successful). Of these 22 ended in abortion (5.5 per cent); there were 3 ectopic preg-

nancies (0.7 per cent). [The abstracter finds much to criticize in this article. The author's standard of sterility is not that generally accepted. The author states that retroflexion tends to hinder conception, but later accepts the principle that retroflexion is no hindrance to pregnancy. Nevertheless, he either corrects the position or performs Gilliam's operation in all cases of retroflexion. Much of the treatment appears superfluous. Thus androgen therapy is given to the male with subnormal semen, and a sperm count persistently below 100,000,000 per ml. is considered subnormal. In one case quoted, endocrine therapy was given to induce ovulation after only one negative endometrial biopsy. In cases of habitual abortion vitamin E and progesterone are given until the ninth month of Ian T. Fraser gestation.]

1954. Results of Treatment of Sterility in Women. (Resultater af Behandling af Sterilitet hos Kvinden.) By J. HOFFMEYER. Nord. Med., 39, 1420-1425, July 30, 1948. 3 figs., 14 refs.

1955. Variations in Spermatogenesis of Oligospermic Men.

By B. Zondek, Y. M. Bromberg, and Z. Polishuk. *Nature*, *Lond.*, 161, 176, Jan. 31, 1948.

Two women, whose husbands had sperm counts of 5,000,000 and 10,000,000 per ml., became pregnant; this suggests that the low counts were not invariable. Twenty-one men with a low sperm count when first examined (all the counts were under 30,000,000 and 12 were under 10,000,000 per ml.) were re-examined 5 to 7 times, always at least 5 days after ejaculation. In 13 of the subjects there were fairly consistent low counts with variations of less than 12,000,000 per ml. The counts in the other 8 cases fluctuated considerably, 2 specimens from the same man differing by as much as 43,000,000 per ml.: 5 of these men had 60,000,000 sperms per ml. in some ejaculates and 2 of their wives became pregnant. It is concluded that oligospermia may be constant or periodic and that single counts may Peter C. Williams mislead.

1956. Variations in Spermatogenesis of Oligospermic Men.

By M. H. JACKSON and C. LARVEY. *Nature*. *Lond.*, 162, 67, July 10, 1948. 2 refs.

1957. Semen Analysis in 204 Cases of Sterile Marriage.

By  $\bar{J}$ . P. ROBERTSON. Sth. med. J., 41, 537-543, June 1948. 4 refs.

1958. Frequency of Undescended Testis and its Importance in Sterility. (Die Häufigkeit des Kryptorchismus und seine Bedeutung für das Sterilitatsproblem.)

By W. Breiphol and H. U. Balzer. Zbl.

Gynäk., 69, 1139-1147, 1947. Bibliography.

Undescended testicles were found in 90 out of 4,500 boys examined (2 per cent). The average age of the boys was 12 years. In 58 cases nondescent was unilateral, and in 32 cases bilateral. Follow-up examination at the age of 15 revealed that spontaneous descent had taken place in 46 boys; 25 boys had been treated surgically (orchiopexy); in 10 cases the testicles were still undescended, and 9 boys failed to report for reexamination. In view of these observations and of reports in the literature, it is thought correct to wait until the onset of puberty, that is, until the age of 15, before treating non-descent of testicles. Surgical treatment should be preceded by administration of hormones. Apparently good results of surgery do not imply that the patient possesses full reproductive powers. The latter should be assessed before the patient marries or at an earlier date, so that statistics may be compiled on the extent of permanent damage caused by non-descent of testicles and on the significance of this condition in reproduction.

[No new facts are brought out in this paper which, apart from the statistical material collected in Berlin, is mostly speculative.]

N. Alders

1959. Genital Complications of Mumps in the Aetiology of Sterility. (Sulle localizzazioni genitali della parotite nella eziologia della sterilità coniugale.)

By E. Robecchi. Ginecologia, Torino, 14, 202-211, May 1948. 21 refs.

Abnormalities of the Reproductive Organs.

1960. Familial Male Pseudohermaphroditism and the Effects of Surgical Castration. (Lo pseudo ermafroditismo maschile famigliare ed effetti su di esso della castrazione chirurgica.)

By A. Giusti. Ann. ital. Chir. 25, 23-40, Jan.

1948. 9 refs.

Two sisters at the age of 7, one in 1935 and the other in 1937, were operated on for bilateral inguinal herniae. At operation minute testicles (proved microscopically) were found in each inguinal canal. These were removed, and the patients were followed up. In 1946 they were seen and found to have developed into healthy-looking girls, with poor distribution of hair. The breasts were not developed, and there was very little subcutaneous fat on the abdomen or on the thighs The external genitalia were normally female in every way, but clinical examination revealed neither uterus nor ovaries. The girls were normal psychologically, but seemed uninterested in sexual activity. Tom Rowntree

1961. True Hermaphroditism.

By W. B. STROME. Amer. J. Obstet. Gynec., 55, 1060-1064, June 1948. 5 figs., 5 refs.

Infections of the Reproductive Organs.

1962. Possibilities of Antibiotic Therapy in Pelvic Inflammation in the Female. (Possibilità terapeutiche degli antibiotici nelle flogosi pelviche femminili.)

By T. Nobile and V. Svrljuga. Ginecologia,

Torino, 14, 229-256, June 1948. 22 refs.

1963. Vaginal Abscess due to Perirenal Abscess. (Coleçã vaginal proveniente de abcesso peri-renal.)
By A. R. DE OLIVEIRA MOTTA. Rev. Ginec.

Obstet., 1, 355-362, June 1948.

1964. Atabrine in the Treatment of Trichomonas Vaginitis.

By F. M. DULA. North Carolina med. J., 9, 309, June 1948.

1965. Tuberculosis of the Female Genitalia. (Contributo della tubercolosi genitale femminile.)

By L. Nobili. Riv. ital. Ginec., 30, 283-322,

1947. I fig., 26 refs.

A study was made of 70 women with genital tuberculosis surgically treated in the Obstetrical and Gynaecological Clinic of the University of Bologna between 1936 and 1946 and selected from 7,653 gynaecological cases admitted. The clinical diagnosis of genital tuberculosis was made in 117 patients (1.53 per cent).

Genital tuberculosis was more frequent in patients

between 21 and 30 years (38.57 per cent of all cases). Some 44 women (62.85 per cent) were sterile; 23 had had full-term pregnancies and 3 had had miscarriages. In 18.75 per cent the onset of menstruation had been delayed. Menstruation had always been regular in 40 per cent and irregular in 30 per cent; in 30 per cent menstrual disorders began with the onset of salpingitis. menorrhoea was the disturbance most frequently encountered. It is considered that in the majority of cases of genital tuberculosis the infection is of secondary origin. In 59.57 per cent of patients in this survey old or recent tuberculous lesions were found, usually pulmonary or intestinal. When the infection is confined to the genital organs it is haematogenous; in cases of associated peritoneal tuberculosis the infection is a descending one. The lesion was in the Fallopian tubes in 54 cases, in the ovary in 10, in the uterine body in 4, and in the cervix in 2. The peritoneum was involved in 44 cases. The symptoms were pain, lencorrhoea, and metrorrhagia, with pyrexia in some cases. Symptoms had started in 52.85 per cent a month before the patient was admitted; in the remainder the duration of symptoms varied from 1 month to over a year.

Before operation the patients underwent a long period of careful medical preparation, on which the author lays great stress. Subtotal hysterectomy and bilateral removal of the adnexa was performed in 45 cases, total hysterectomy and bilateral removal of the adnexa in 2 cases. Removal of the adnexa was bilateral in 4 cases and unilateral in 2. The tendency in the Bologna clinic is towards a liberal removal of all tuberculous foci and suspected tissues, but a more conservative attitude is adopted in inactive forms, without extensive adhesions, when the uterus is intact and the patient in good general condition. Exploratory laparotomy is chosen, with removal of the infected organs where possible, in diffuse genito-peritoneal fibro-caseous tuberculosis and in the exudative forms. patient died after operation. The results were classified as very good in 9 cases and good in 56 cases, the condition being unchanged in 4. Five patients died between 2 and 5 years after operation.

[It is not possible to do justice to this valuable article in a short abstract.] Rina Saunders

1966. Hysterosalpingograms in Genital Tuberculosis in Women. [In English.]

By V. MADSEN. Acta radiol., Stockh., 28, 812-

823, Nov. 13, 1947. 11 figs., 3 refs.

This is a survey of the radiographic findings in 42 patients, in 20 of whom the diagnosis of genital tuberculosis was confirmed by histological examination. In the other 22 there was no such confirmation, but the clinical evidence was in favour of this diagnosis. The author, though admitting that all salpingographic forms may be encountered in tuberculous salpingitis, claims that there are

certain features suggestive of a tuberculous actiology. His remarks refer only to the chronic forms of salpingitis. The most striking feature is the retention of the opaque medium in tubes which show little or no dilatation, in contrast to the marked dilatation that occurs in, for instance, the gonorrhoeal form of the disease. This feature was seen in 29 out of the 42 cases. In addition, there may be evidence of calcification in the tubes, and the contrasting shadows of this and the opaque medium give rise to a characteristic picture. In 2 cases tuberculous endometritis was suspected, because an irregularity of the uterine wall was associated with lack of filling in the tubes. In one case in which the abdominal ostium was patent the contrast medium that had spilled into the pelvis formed globules, indicating ascites. The presence of calcified glands in the pelvis associated with these findings is also in favour of a tuberculous origin. L. G. Blair

1967. Further Experiences in the Roentgen Diagnosis of Tuberculous Salpingitis. [In English.]

By W. MAGNUSSON. Acta radiol., Stockh., 28,

824-832, Nov. 13, 1947. 8 figs., 8 refs.

In a previous communication the author, from a study of 12 cases of tuberculous salpingitis verified histologically, described a radiological picture which he claimed to be diagnostic of a tuberculous The picture was characterized by actiology. uneven, jagged, and ragged mucosal contours and small lumen defects, the anatomical basis for these changes being the swollen and tightly folded mucous membrane. After a study of 7 fresh cases and re-examination of all cases with tubal occlusion, second type of salpingographic picture is described, characterized by even, straight, or rigid mucosal contours and a pipe-like appearance of the tube. In these cases histological examination showed the folds of the mucous membrane to be very adherent to each other and the lumen to be more or less obliterated. Both types may be seen in the same case. Fistulae and abscess-like processes leading from the lumen may also be found in both types. In a control series in which there had been either a gonorrhoeal infection or septic infection after abortion, the appearances described above were absent. It is claimed, therefore, that a pre-operative diagnosis of tuberculous salpingitis is possible in most cases of sterility where tuberculosis is the cause.

The author reports no instances of spreading of the tuberculous process, but states that hysterosalpingography is contra-indicated when clinical signs of active inflammation, whether tuberculous or otherwise, are present.

L. G. Blair

1968. Diagnosis of Primary Tuberculosis of the Cervix. (Le diagnostic de la tuberculose primitive du col utérin.)

By P. NORMAND and P. LABIGNETTE. Presse

méd., 56, 95, Feb. 7, 1948. 1 fig.

1969. A Case of Genital (Utero-tubo-ovarian) Tuberculosis with Particular Involvement of the Endometrium. (Descrizione di un caso di tubercolosi genitale (utero-tube-ovaie) con alta prevalenza endometriale.)

By C. P. Morano. Monit. ostet.-gynec., 19, 103-114, Mar.-Apr. 1948. 4 figs., 52 refs.

1970. Penicillin-Procaine in Acute Parametritis and Salpingitis.. (Penicilina-novocaína en las anexo parametritis agudas.)

By M. González. Arch. Soc. Ciruj. Hosp., 17.

507-519, Sept. 1947. 3 figs., 11 refs.

In view of the application of the work of Leriche on procaine block to gynaecological conditions by several authors, and also of the use in inflammatory conditions of the eye of a procaine-penicillin mixture, the author had employed this mixture in the treatment of a series of cases of acute infection of the parametrium and uterine appendages. After discussing at length the innervation of the pelvic organs, he describes his technique in detail and the results in 16 cases. The mixture employed consists of 50 ml. of 1 per cent procaine in which 100,000 units of penicillin are dissolved. Two long narrow retractors are passed into the vagina, and the cervix is pulled to one side by an instrument gripping the posterior lip. A 20-ml. syringe with a fine needle not less than 10 cm. in length is used. The needle is introduced parallel to the cervix and must be inserted to a depth of I to 2 cm. into the lateral fornix in order to inject the ganglion of Frankenhaüser. The patient should then complain of pain, and 10 ml. of solution is injected. The needle is partly withdrawn and reinserted to reach the more lateral part of the broad ligament, where a further 10 ml. is injected. The usual precaution of aspiration before injection is taken. The procedure is then repeated on the opposite side. Finally 10 ml. is injected into the posterior fornix, care being taken not to insert the needle for more than 2 cm. in order to avoid entering the pouch of Douglas. Gentleness is essential in the procedure. Five patients felt faint, and there was haemorrhage from the site of puncture in 2 cases, in 1 of which vaginal packing was needed.

In 7 patients who were followed up for 6 months an anatomical and functional cure was obtained, though in 2 cases a second injection was necessary. In 6 cases there was either no follow-up study or the period after injection is short, but in most of these the immediate results were satisfactory. In 3 patients the treatment failed; 2 were operated upon for pyosalpinx, and the third had appendicitis. In this latter case, however, the failure of the injection to relieve pain was considered to be a helpful diagnostic feature. After discussing the various theories about the action of procaine, the author puts forward the view that the two drugs have a synergistic action. This treatment is recommended on the grounds that it is successful, economical,

harmless, and simple, and can be carried out on ambulant patients.

Bryan Williams

New Growths of the Reproductive Organs.

1971. An Experiment With Uterine Cervical Smears in the Diagnosis of Genital Malignancies.

By G. M. WILCOXON and F. H. FALLS. Ohio St.

med. J., 44, 165-167, Feb. 1948. 7 refs.

Of all primary cancers occurring in women 24.6 per cent arise in the genital tract. Primary breast cancers account for 18.4 per cent. In recent years many workers have shown that malignant uterine neoplasms can be diagnosed by the vaginal smear technique, and that the vaginal smear is also valuable in following the treatment of uterine malignancy by radiation therapy. In the present study the technique of vaginal smear has been applied to the uterine cervix. The method of taking the cervical secretion and the preparation and staining of the slides are described.

Cervical smears were taken from new cases seen at the cancer clinic at Research and Educational Hospitals of the University of Illinois and from patients admitted to the gynaecological wards. Of 236 cases studied, 198 showed no evidence of cancer. In this series of 198 negative cases there were 18 false-positive diagnoses. These are all regarded as mistaken because no positive pathological evidence of malignancy was demonstrated; they represent an error in the total number of cases followed of 7.6 per cent. Of the 236 patients 38 were shown to have cancer. In 2 of these 38 cases the smears were negative: a case of epidermoid carcinoma of the cervix, negative on first smear but positive on a second; and a case of leiomyosarcoma of the uterus from a degenerating fibroid where the neoplasm probably never exfoliated any malignant cells into the uterine canal; the uterine mucosa was normal. The positive cases included 21 of carcinoma of the cervix; in 17 of these there were epidermoid carcinomata and in the rest squamous-celled carcinomata. Seven cases of fundal cancer were seen— 4 of adenocarcinomata, I of adenocanthoma, and two of leiomyosarcomata. Lilian Raftery

1972. A Correlation between Vaginal Smear and Tissue Diagnosis in 1045 Operated Gynecologic Cases.

By N. P. Isbell, J. F. Jewett, M. S. Allan, and A. T. Herrig. Amer. J. Obstet. Gynec., 54,

576-583, Oct. 1947. 36 refs.

In 1,045 cases the authors compared the relative values of vaginal smears and of biopsy and curettage in the diagnosis of uterine cancer. They also studied the practical aspects of the technique, with reference to the special training required. The material was collected from in-patients on the day before they underwent operation and from outpatients from whose cervices biopsy specimens were subsequently taken. Smears were prepared and stained by the Papanicolaou technique and interpreted by one or other of the authors who, at

the time of giving his report, was ignorant of the clinical history and biopsy diagnosis. The smear was reported to be positive or negative for carcinoma, and this first report was accepted for the purpose of the study, irrespective of any later diagnosis.

The results were divided into three groups. The first included 1,000 cases in which the diagnosis from the biopsy specimen was definite. second consisted of 41 in which the diagnosis was doubtful. The third consisted of 4 cases in which carcinoma was encountered elsewhere than in the uterus or vagina. In the first group there were 60 cases of carcinoma-40 of the cervix, 18 of the body, and 2 of the vagina. In 39 cases of carcinoma of the cervix, 15 cases of carcinoma of the corpus uteri, and the 2-cases of vaginal carcinoma, the diagnosis was made from the vaginal smears. In the 60 cases of proven carcinoma there were, therefore, 4 false-negative results from the smear technique. In the remaining 940 cases there were II false-positive results from the smears. As would be expected, there was a greater incidence of disagreement between the results of vaginal smear and biopsy in the second group of doubtful cases. Group 3 contained 4 cases of carcinoma—1 of the Fallopian tube, I of the bladder, I of the wrethra, and r of the vulva-and in each case the smear revealed malignant cells. The time taken to report on an average smear was from 15 to 20 minutes, while in difficult cases as long as 2 hours was necessary. The authors concluded that vaginal smears offer a valuable accessory aid to diagnosis, but note that in comparison with biopsy the method has an irreducible limit of error.

J. Stallworthy

1973. Value in Clinical Diagnosis of Study of the Morphological Components in the Vaginal Smear. (Uber die klinisch-diagnostische Auswertungsmöglichkeit der morphologischen Bestandteile im Vaginal abstrich der Frau.)

By H. Perli. Acta obstet. gynec. scand., 28, 38-76, 1948. 51 refs.

1974. Practical Application of the Vaginal Smear as a Method in Clinical Gynecology.

By I. SLOVIN, W. B. SILBERBLATT, and H. B. SAFFORD. Delaware med. J., 20, 109-112, June 1948. 10 figs., 1 ref.

1975. The Vaginal Smear. Its Value to the Internist, with Report of Diagnosis of Unsuspected Uterine Cancer in Four Cases.

By M. Fremont-Smith and R. M. Graham. J. Amer. med. Ass., 137, 921-922, July 10, 1948. 11 refs.

1976. Cytological Diagnosis of Uterine Cancer. (Citodiagnóstico del cáncer uterino.)

By G. TERZANO. Rev. mex. Cir. Ginec. Cáncer, 16, 11-17, Jan. 1948.

1977. Prognostic Value of Erythrocyte Sedimentation Rate in Malignant Tumours of the Female Genitalia. (Sul valore prognostico della velocità di sedimentazione dei tumori maligni dell'apparato genitale femminile.)

By Z. Sisino. Ginecologia, Torino, 14, 185-188,

Apr. 1948.

1978. Leucoplakia of the Vulva. Preliminary Report. By N. F. MILLER, M. H. PARROTT, J. STRYKER, G. M. RILEY, and A. C. CURTIS. Amer. J. Obstet., 54, 543-560, Oct. 1947. 9 figs., 18 refs.

The term leucoplakia is used to include both the hypertrophic and the atrophic phases of the disease more commonly referred to as kraurosis. The records of 153 patients who had attended the University of Michigan Hospital since July, 1931, were studied. Thirty-six cases have been investigated in more detail since January, 1946, but 25 of these were also included in the previous group referred to by the authors as the "pre-study group". There were no Negresses in the series. In this prestudy group the average age was 55.6 years, the eldest patient being 80 and the youngest 23. One patient, aged 23, was pregnant; 114 patients were post-menopausal, and in 10 the menopause had been induced artificially; 33 had an associated carcinoma of the vulva. In 54 cases a vulvectomy was performed, with a recurrence of symptoms in 13.

The group of 36 patients were studied according to an agreed plan, which included investigation of the dermatological, allergic, and psychiatric aspects of each case. Focal sepsis was looked for. Urine and gastric contents were analyzed. Assays of hormones were made, including the oestrogens, follicle-stimulating hormone, and 17-ketosteroids. The lesions were photographed, biopsies, smears, and cultures were studied, and the blood examinations included serological tests and estimations of ascorbic-acid and vitamin-A levels.

In 10 of 24 patients, in whom a complete blood study was carried out, there was evidence of infection as indicated by raised erythrocyte sedimentation rate, toxic granulations, or leucocytosis. No cause-and-effect relation was established between emotional instability and the disease. Chronic irritation of the vulva was not found to be an aetiological factor. Eleven of 25 patients examined for allergy had an allergic background and in 2 some relief was obtained by removal of the allergen. A low vitamin-A level was observed in the plasma of only 1 of 10 patients investigated, but achlorhydria was found in 6 of 12 patients studied. Two of these were suffering from pernicious anaemia. In 14 of 22 patients the ascorbic-acid level in blood was found to be normal or high. In 22 of 26 patients oestrogen levels were normal. No significant features were found in the excretion of 17-ketosteroids or follicle-stimulating hormone.

J. Stallworthy

1979. An Epidermoid Cyst of the Vulva. (Una cisti epidermoide della vulva.)

By V. Arnone. *Monit. ostet.-gynec.*; 19, 115-125, Mar.-Apr. 1948. 2 figs., 18 refs.

1980. Bowen's Disease of the Vulva. (Vulvite erosiva epiteliomatosa (Morbo di Bowen).)

By F. Lisi. Ann. ital. Derm. Sif., 3, 181–189, May-June 1948. 1 fig., 17 refs.

1981. A Study of Pre-carcinoma of the Vagina. (Contribución al estudio del epitelioma incipiente de la vagina (Precáncer de vagina).)

By J. VANRELL. Rev. esp. Obstet. Ginec., 7, 143-147, May-June 1948. 2 figs., 6 refs.

1982. A Consideration of Some Uterine and Ovarian Tumors.

By A. H. CURTIS. West. J. Surg. Obstet. Gynec., 56, 404-406, July 1948. 2 figs.

1983. Ligation of the Internal Iliac Artery in Haemorrhage due to Uterine Carcinoma. (Uber die Unterbindung der Arteria hypogastrica bei Blutungen infolge Gebärmutterkrebs.)

By W. Michel. Zbl. Gynäk., 69, 1188-1192, 1947. 3 refs.

1984. Prognosis and Treatment of Carcinoma of the Body of the Uterus. (Le pronostic et le traitement du carcinome du corps utérin.)

By R. Bourg and J. Fally. Brux-méd., 28, 1481-1493, July 18, 1948. 3 figs., 25 refs.

1985. Metastases in the Bony Pelvis Due to Carcinoma of the Body of the Uterus. (Beckenknochenmetastase eines Korpuskarzinoms.)

By V. GRUNBERGER. Krebsarzt, 3, 262-267, July 1948. 1 fig.

1986. Supraclavicular Metastases from Carcinoma of the Uterus. (Le metastasi sopraclaveari del cancro dell'utero.)

By F. de Simone. Radiologia, Roma, 4, 109-122, Apr.-June, 1948. 23 refs.

1987. Phosphorus Metabolism in the Normal and in Pathological Conditions. II. Ribonucleic Acid in Inflammations, Erosions and Cancer of the Human Cervix Uteri. [In Russian.]

By A. G. Andres and K. A. Perevoshchikova. Arkhiv Patologii, 10, 3-11, 1948. 6 figs., 15 refs.

1988. Surgery in Carcinoma of the Cervix. (La cirugia en el cancer del cuello uterino.)

By C. Zuckermann. Rev. mex. Cir. Ginec. Cáncer, 16, 3-8, Jan. 1948. 21 refs.

1989. Dosage Estimation and Distribution in the Radium Treatment of Carcinoma of the Cervix Uteri. A New Method and its Clinical Applications.

By M. Lederman and L. F. Lamerton. Brit. J. Radiol., 21, 11-26, Jan. 1948. 24 figs., 13 refs. The authors describe fundamental work on dosage in radiotherapy of carcinoma of the cervix

as employed at the Royal Cancer Hospital, London. They describe a technique of determining the dose at a point in the pelvis during the radium treatment which can be applied to any individual case. They use a double-shift radiographic method of estimation of the positions of the radium sources, from which they reconstruct actual positions in space. They then use Mayneord's contour-projector to obtain the actual dosage delivered. The method seems simple and reasonably quick. By means of a special "localiser" and opaque media the authors study the dosage received by normal structures and by lymph-nodes. Among their investigations they describe an ingenious adaptation of a Ferguson mouth-gag, by which they have demonstrated a variation in vaginal vault diameter from 4 to 11 cm., and show a diminution between successive radium treatments of 0.5 to 1.5 cm. Their aims are: (1) To estimate the dose received by diseased tissues. (2) To estimate the dose received by the adjacent normal tissues. (3) To investigate the anatomical and technical factors affecting the dose. (4) To help to correlate radium and X-ray treatments. Each of these is discussed in some detail.

This paper records most interesting progress in the work begun by the abstracter on these problems. It is to be noted that the authors do not discuss the problems of the shape of the volume-dosage delivered, which may not correspond with the volume of the tumour tissue involved. The abstracter has found that dosage estimated at one point only may be misleading (Sandler, Proc. R. Soc. Med., 1945, 38, 175) because the point may really be a point of maximum dosage for that particular isodose surface, which may rapidly recede from the pelvic wall. Although much more work requires to be done on the actual shapes of volume-dosage obtained and on the particularly difficult problem of matching this shape to the X-ray volume dosage, this paper is nevertheless a notable contribution to a fundamental problem in the treatment of carcinoma.] B. Sandler

1990. Late Results of Radium Therapy for Carcinoma of the Uterine Cervix.

By H. H. Bowing and R. E. Fricke. J. Amer. med. Ass., 137, 935-942, July 10, 1948. 19 refs.

1991. 42.5 Per Cent of Complete Cures in 41 Cases of Carcinoma of the Cervix. (42.5 Prozent absolute Heilung bei 41 Kollumkarzinomfällen.)

By F. Friedl. Zbl. Gynäk., 69, 1192-1199, 1947. 2 figs., 7 refs.

1992. Experimental Studies on the Pathogenesis and Histogenesis of Ovarian Tumours in Mice.

By M. H. Li and W. U. Gardner. Cancer Res., 7, 549-566, Sept. 1947. 22 figs., bibliography.

The authors describe a number of granulosa-cell and luteal-cell tumours which arose from intrasplenic transplants of ovarian tissue in castrated male and female mice. Most of the tumours

developed after 7 months from the time of operation. With one exception, no tumours arose from subcutaneous or intratesticular grafts of ovarian tissue in either intact or castrated male or female mice. Ovarian hormones produced by intrasplenic ovarian grafts are inactivated by the liver, and there is concomitant increase in the production of pituitary gonadotrophins in these mice. The endocrine imbalance so established results in sustained excessive stimulation of the ovarian transplants, and this is believed to be responsible for the frequent development of tumours from transplants in the spleen, in sharp contradistinction to those in other situations. Possibly similar gonadotrophic overaction is responsible for the granulosa-cell tumours which arise in irradiated ovaries.

R. A. Willis

1993. Malignant Tumours of the Ovary.

By J. B. Montgomery. Amer. J. Obstet. Gynec.,

55, 201-217, Feb. 1948. 6 refs.

In this study the author reviews all the malignant tumours of the ovary treated at the Jefferson Medical College Hospital, Philadelphia, between 1921 and 1946. Altogether 107 are reviewed, 84 of which were primary carcinomata, 7 secondary to uterine cancers, 2 adenocarcinomata occurring in teratomata, 10 granulosa-cell tumours, 1 a Krukenberg tumour, 2 dysgerminomata, and 1 a Brenner tumour. The present paper deals chiefly with the 84 cases of primary cancer. Most of these occurred in patients aged from 40 to 49, but 1 patient was 16 and one 73; 57 per cent were between the ages of 40 and 60, and 31 patients had passed the menopause. Of the married women 11 per cent were sterile.

The chief symptoms were pain (53 cases) and enlargement of the abdomen (59 cases). Nausea and vomiting, loss of weight, backache, weakness, and dyspnoea were mentioned less often; 14 per cent had bleeding and of these about half had associated fibroids. The four factors particularly studied were (a) the extent of the growth, or the operability; (b) the grade of malignancy; (c) the histological type of tumour; (d) the influence of X-ray therapy on the lesion. The tumours were classified as either serous or pseudo-mucinous, and divided into three histological grades of malignancy: Grade I or low-grade malignancy, Grade II or intermediate-grade malignancy, and Grade III or high-grade malignancy (anaplastic).

In Grade I there were 21 cases, 14 serous and 7 pseudo-mucinous. Eleven patients are living from 5 to 24 years after operation, but only 10 of these are free from disease. Seven who survived for 5 years had serous tumours, of which 3 were completely operable. All but 1 received X-ray therapy. The 4 others who survived for 5 years had unilateral completely operable pseudo-mucinous tumours, and 2 received X-ray therapy. In Grade II there were 23 cases, 19 serous and 4 pseudo-mucinous. Four

patients are living; 3 are free from disease from 5 to 20 years after operation and 1 had a recurrence in the cervix after 7 years. Three of the 4 survivors had bilateral serous tumours. In I the growth was removed entirely but in 2 removal was incomplete. The fourth survivor had a completely operable unilateral pseudo-mucinous adenocarcinoma. All 4 received deep X-ray therapy. In Grade III there were 40 cases, 39 serous and 1 pseudo-mucinous. One patient is free from disease 21 years after complete removal of a unilateral serous papillary tumour (partly solid and partly cystic) followed by deep X-ray therapy. Two have been free from disease for less than 5 years. A 5-year study is possible in 68 patients. The total 5-year salvage rate is 20.5 per cent. The 5-year survival rate in Grade I was 62.5 per cent, in Grade II 15.8 per cent, and in Grade III 3 per cent. These figures emphasize the importance of grading in the prognosis of ovarian cancer.

The most important factor influencing prognosis is the extent of the growth. In 19 (22.6 per cent) the growth was completely operable, and 10 of these are free from evidence of disease from 4 to 24 years after operation; in 30 (35.7 per cent) it was incompletely operable, and only 4 were free from gross disease for more than 5 years; in 35 (41.6 per cent) it was inoperable, but 1 of these patients is alive with extensive disease still present 12 years after

exploratory laparotomy.

The results substantiate the view that pseudomucinous tumours are less malignant than the scrous variety. Of the 68 patients who had scrous growths and have been followed up for over 5 years 9 are free from disease, while of the 10 with pseudomucinous tumours 5 are alive and well. At least three pathological entities are of prognostic importance, that is, the papillary cysts, the partly solid and partly cystic tumours, and the solid tumours. Twelve of the 16 patients alive for 5 or more years had papillary cysts. Only 4 of the 37 with partly solid and partly cystic tumours have survived more than 5 years, and all of the 18 who had solid cancers are dead.

Of 10 patients with granulosa-cell tumours 4 are alive and free from recurrence but only 3 for more than 5 years; 3 are dead. One of these died of cerebrospinal syphilis, another from X-ray damage to the large bowel, and the third died 8 years after incomplete operation. There were 7 cases of ovarian carcinoma associated with adeno-carcinoma of the endometrium. One patient is alive and well 1½ years after operation. Two patients with dysgerminomata have remained well for 3 and 24 years; 2 with adenocarcinomata developing in teratomata are dead. One patient who had a Brenner tumour is well 8 years after operation and 1 with a Krukenberg tumour died 3 months after operation.

The authors conclude that operability and grade of malignancy are undoubtedly the factors that influence prognosis. Although many ovarian-

tumours are silent or nearly so, 37 per cent of the author's patients had abdominal symptoms, mostly referable to the gastro-intestinal tract, for 6 months to several years before a pelvic examination was made. Doubt is cast on the value of peritoneoscopy in diagnosis, for the ovary is often difficult to visualize if it is not enlarged, especially in obese women. If malignant disease of the ovary is to be detected at an early stage in more than an occasional patient, routine 6-monthly pelvic examinations will have to be carried out.

F. J. Browne

1994. Thecoma of the Ovary and Carcinoma of the Endometrium. (Tecoma del ovario y carcinoma del endometrio.)

By J. C. AHUMADA, R. SAMMARTINO, and J. L. SARDI. Obstet. Ginec. lat.-amer., 6, 34-43, Jan.-

Feb. 1948. 5 figs., 12 refs.

The association of an ovarian thecoma (xanthofibroma theco-cellularis of Loeffler and Priesel) with carcinoma of the endometrium has been noted by several workers. This coincidence has led to the hypothesis that the malignant tumour of the uterus results from the prolonged stimulation of the endometrium by oestrogenic hormone produced in the ovarian tumour. The authors describe 3 cases. In the first case a diffuse carcinoma of the endometrium was found in association with incipient thecomata in both ovaries. In the second case, there were irregular areas of atypical endometrial proliferation. In some of these areas cystic glandular hyperplasia was present with neoplastic proliferation in other areas. The left ovary contained a thecoma measuring 10 x 8 mm. In the third case the endometrium at the fundus uteri was polypoidal. Elsewhere in the uterus it was atrophic. Several intramural fibroids were found. In the polypoidal endometrium there were glandular proliferation, with many atypical nuclei and areas of stratification typical of adenoacanthoma, and a right hydrosalpinx. The left ovary contained a small multicentric thecoma.

The authors conclude that the co-existence of hyperplasia of the endometrium with thecoma of the ovary is relatively common. In these cases it is impossible to decide whether there is a carcinoma of the endometrium or a carcinoid hyperplasia of the endometrium. It seems, in fact, that these conditions of the endometrium are caused by thecomata in the ovaries. In all cases the atypical proliferation of the endometrium is preceded by hyperplasia of non-specific origin. The ovarian thecoma must be considered as an important factor in the production of post-menopausal hyperplasia of the endometrium. In many cases the tumour in the ovary is so small that it is overlooked at gynaecological examination. In every case of postmenopausal hyperplasia of the endometrium the existence of functioning ovarian tumour, thecoma, or granulosa-cell tumour, must be borne in mind.

[Since the original description of the thecoma in 1932, the number of cases recorded has increased almost annually. This is an important ovarian tumour and one which, as the authors rightly state, is often overlooked. This serves to emphasize the importance of careful treatment of cases of hyperplasia of the endometrium, not only after, but also at the time of the menopause. There is no doubt that in the majority of these cases hysterectomy is the safest treatment; whenever possible the ovaries should be carefully examined.]

Josephine Barnes

1995. Pathology and Clinical Features of Fibroma Thecocellulare Xanthomatodes of the Ovary. (Zur Pathologie und Klinik des Fibroma thecocellulare xanthomatodes ovarii.)

By K. Jaroschka. Zbl. Gynäk., 69, 1228-1232, 1947. 3 figs., 8 refs.

1996. Gigantic Ovarian Cyst Developing in a Thecoma. Problems Encountered in Surgical Management.

By W. C. REINER. West. J. Surg. Obstet. Gyñec., 56, 205-207, Apr. 1948. 4 figs., 4 refs.

1997. So-called Brenner Tumours. (Ueber sogenannte Brenner-Tumoren.)

By O. PENDL. Wien. klin. Wschr., 60, 414-418, July 2, 1948. 52 refs.

1998. Papillary Cystadenocarcinoma of Both Ovaries. Report of a Case with Apparent Cure Eight Years After Operation.

By G. L. GAUDRAULT. New Engl. J. Med., 239, 56-57, July 8, 1948. 1 fig., 4 refs.

1999. Thyrotoxicosis in Struma ovarii. (Thyreotoxikose bei Struma ovarii.)

By R. GANSE. Zbl. Gynäk., 69, 1205-1206, 1947.

2000. Krukenberg's Tumour. (Tumor de Krukenberg.)

By P. B. RIBEIRO. Rev. brasil. Cir., 17, 327-332, June 1948. 3 figs.

2001. Krukenberg Tumor with Osteoplastic Metas-

By J. H. Zeigerman. Amer. J. Obstet. Gynec., 56, 187–190, July 1948. 3 figs., 4 refs.

2002. Contributions to the Study of Metastic Tumours of the Ovary. Krukenberg's Tumour. (Contributo allo studio dei tumori metastatici dell' ovaio tumori di Krukenberg.)

By F. TRUINI. Clin. nuova, 6, 63-71, 1948. 4 figs., 13 refs.

2003. Meig's Syndrome. Report of a Case of Fibroma of the Ovary with Ascites.

By W. L. Sibley. Sth. Surg., 14, 456-461, July 1948. 2 figs., 26 refs.

2004. Ovarian Fibroma with Ascites and Hydrothorax. (Meig's Syndrome.) [In English.]

By N. CLEMENTSEN. Acta obstet. gynec. scand., 28, 96-104, 1948. 21 refs.

2005. Fibroma of the Ovary with Ascites and Hydrothorax.

By P. M. Spurney. Ohio St. med. J., 44, 722, July 1948. 11 refs.

2006. Two Cases of Granulosa-cell Tumour. (Sóbre dois casos de tumores de células granulosas.)

By W. PAINAO. Rev. Ginec. Obstet., 1, 295-308, May 1948. 2 figs., 21 refs.

2007. Ovarian Teratoma with Rupture into the Bladder, Heum and Rectum. (Teratom des Ovariums mit Durchbruch in die Harnblase und Heum bzw. Rektum.)

By W. Brosig. *Xbl. Chir.*, 72. 1319-1326, 1947. 5 figs., 31 refs.

2008. Primary Teratomatous Chorionepithelioma of the Ovary. Report of a Case.

By H. M. OLIVER and E. O. HORNE. New Engl. J. Med., 239, 14-16, July 1, 1948. 2 figs., 28 refs.

2009. Ovarian Dysgerminoma.

By A. F. PAGANO. Amer. J. Obstet. Gynec., 55, 1058-1059, June 1948. 2 figs.

2010. Endometriosis.

By J. V. Meigs. Ann. Surg., 127, 795-809, May 1948. 29 refs.

2011. The Part Played by Endometriosis in Gynaecological Conditions. (La place de l'endométriose en gynécologie.)

By P. Broco. Rev. brasil. Cir., 17, 289-296, June 1948.

2012. The Use of Multiple Sources of Radium within the Uterus in the Treatment of Endometrial Cancer. By A. N. ARNESON, W. W. STANBRO, and J. F. NOLAN. Amer. J. Obstet. Gynec., 55, 64-78, Jan.

1948. 16 refs.

More contributions are appearing on the subject of the scope of modifications of Heyman's method of treating cancer of the uterine body by irradiation. In the present paper the authors examine their results in 93 cases treated between 1936 and 1941 inclusive. Hysterectomy was performed in 18 cases with a 5-year survival rate of 84 per cent; 32 cases were treated by irradiation followed by hysterectomy, with a 5-year survival rate of 18 per cent; 43 cases were treated by irradiation alone, and the 5-year survival rate was 27 per cent. [Careful examination of these figures is necessary to see which patients were operated upon and which had irradiation; also, the methods of irradiation changed in the period under review.] Until 1938 a tandeni applicator was used; since then the technique has been altered to one in which multiple capsules are

packed into the cavity. Before application of the radium a course of deep X-ray therapy is given (four pelvic fields and a total dose to each area of about 1,200 to 1,600 r). The survival rate for 5 years in the whole series was 53 per cent. The best prognostic sign was found to be the disappearance of the tumour in the uterus after pre-operative irradiation. The survival rate also varied with the uterine size and the histological type of the growth. Kenneth Bowes

2013. Leiomyofibroma of the Fallopian Tube. By S. W. STRINGER. N. Y. St. J. Med., 48, 1621, July 15, 1948. 1 fig., 15 refs.

Operations.

2014. Necrotizing Enteritis as a Postoperative Complication in Gynaecology. (Der Darmbrand als postoperative Komplikation in der Gynäkologie.)

By H. E. RUTHER. Geburtsh. u. Frauenheilk., 8, 467-478, June, 1948. 1 fig., 19 refs.

2015. Vaginal Operation Technique. (Zur vaginalen Operationstechnik.)

By F. Friedl. Zbl. Gynäk., 69, 1184-1188, 1947.

2 figs., 3 refs.

A description is given, with two photographs, of four new instruments for vaginal surgery. The first is a self-retaining speculum, the second an apparatus for suspending the legs in the lithotomy position, while the third and fourth are instruments for assisting the excision of the parametrium during radical hysterectomy.

S. S. B. Gilder

2016. A Multiple Sulfonamide Therapeutic Measure in the Postoperative Care of the Cervix and Vagina. By A. H. MARBACH. Amer. J. Obstet. Gynec.,

55, 511-517, Mar. 1948. 24 refs.

After vaginal operations healing tends to be . delayed because of the changes in the vaginal flora, the approach of the pH to neutrality, and the decrease of available glycogen. The author, in order to combat sepsis and promote healing, has introduced a cream containing 3.42 per cent sulphathiazole, 2.86 per cent acetyl-sulphanilamide, 3.7 per cent benzoyl-sulphanilamide, and I per cent urea peroxide. After tests to determine the toxicity and bacteriostatic power of the preparation it was used clinically in 200 cases—121 cases of conization of the cervix and 79 vaginal plastic operations. Within 24 hours after operation approximately 5.0 g. of the cream was inserted into the vagina twice daily. Malodorous discharge was non-existent in all the treated cases and healing time of the mucosal surfaces was reduced to 50 per cent of that in F. J. Browne control cases.

2017. A Simple Instrument for Puncture of the Pouch of Douglas. (Egyszerű esköz a Douglas tasak és méhfüggélekek kémlö szúrásához.)

By E. Burg. Orv. Lapja, 4, 561-562, Apr. 25, 1948. 2 figs., 5 refs.

2018. Fistula of the Upper Part of the Sigmoid due to Operative Trauma. Intervention through the Posterior Fornix, and Cure. (Fistola della porzione alta del sigma da ferita operatoria. Intervento attraverso il fornice posteriore e guarigione.)

By A. Fornero. Monit. ostet.-gynec., 19, 87-91, Mar.-Apr. 1948. 2 figs.

2019. Analgesia of the Hypogastric Ganglion in Diagnostic Curettage. (L'anestesia del ganglio ipogastrico nel raschiamento diagnostico.)

By G. DE GIOSUE. Monit. ostet.-ginec., 19, 5-12, Jan.-Feb. 1948. 13 refs.

The author has performed infiltration of the hypogastric ganglion, using the method of Gellert. on 50 women who were afterwards subjected to diagnostic curettage. In nearly all these cases, particularly when infiltration was preceded by administration of morphine, the results were very satisfactory and dilatation and curettage were

carried out without causing pain.

Gellert's technique (Zbl. Gynäk., 1926, 14, 117) is simple. It includes disinfection of external genitalia and the vagina, exposure of the uterine portio with a speculum, application of a volsellum forceps to the cervix, and exertion of traction in a direction opposite to the side-on which the needle is to be introduced. The needle should have a calibre of 1.5 mm. and a length of 10 to 12 cm. It is introduced into the lateral fornix to a depth of about 2 cm., with a slightly posterior inclination. Ten to 15 ml. of the analgesic solution is slowly injected, after aspiration has shown that no blood vessel has been entered. The fluid is introduced without force. The procedure is repeated on the opposite side. After 10 minutes the operation is begun.

The author, who studied 50 cases at the Obstetrical and Gynaecological Clinic of the University of Florence, found dilatation of the cervical canal very easy to perform in his patients and ascribes this fact to loss of tone of the circular muscle fibres. No untoward effects of blocking the hypogastric ganglions were noticed, apart from slight signs of shock in exsanguinated patients. The postoperative course was uneventful and afebrile in all cases. In 5 cases analgesia was not produced. In 3 of these the uterus was retroverted and the failure

is ascribed to this.

2020. Changing Concepts in Cervical Biopsy. By K. E. Cox, V. B. Buhler, and W. C. Mixson. Amer. J. Obstet. Gynec., 56, 112–122, July 1948. 7 figs., 4 refs.

Nicholas Alders

2021. Uterine Suspension: A Report of Results. By W. H. VOGT, R. V. BOEDEKER, and G. LOPEZ. Amer. J. Obstet. Gynec., 55, 1044-r047, June 1948. I ref.

2022. The Frequency of Hysterectomy for Benign Uterine Disease.

By H. D. LAFFERTY. Pennsylvania med. J., 51, 993-997, June 1948. 2 figs., 12 refs.

2023. Prolapse of the Vaginal Vault Following Hysterectomy. A New Method of Repair.

By H. N. SHAW. West. J. Surg. Obstet. Gynec.,

56, 127-133, Mar. 1948. 7 figs., 3 refs.

Three cases of prolapse of the vaginal vault after hysterectomy are described. The prolapse was repaired from above by using two vertical strips of anterior rectus sheath, hinged below and each passed medial to the corresponding rectus muscle and extraperitoneally to be attached to the cervical stump or vaginal vault. The operations were all performed less than 6 months before the cases were reported, and the results are not discussed.

Aileen M. Dickins

2024. The Present Status of Female Sterilization Techniques in the United States.

By R. J. McNeil and A. N. Webb. Calif. Med., 69, 39-46, July 1948. 5 figs., 13 refs.

2025. Injuries to the Bladder in Gynaecological Surgery.

By J. K. FEENEY. Irish J. med. Sci., 6, 112-120,

Mar. 1948. 6 refs.

The bladder is most likely to be injured in total hysterectomy, Wertheim's hysterectomy, and plastic operations for vaginal prolapse. The bladder may be injured in abdominal operations: (a) During incision of the parietal peritoneum. This accident can be avoided by continuous drainage of the bladder for the half hour immediately before operation, by making the peritoneal incision in the upper limits of abdominal wound, and by suspecting the presence of a high bladder when the tissue on separation of the recti muscles has a fleshy appearance, and incision into it causes venous oozing. (b) In the downward displacement of the bladder before the uterine arteries are clamped and the vagina opened in total hysterectomy. Failure to displace the bladder well downwards may result in injuries during division of the anterior vaginal wall, during clamping of the lateral cervical attachments, and during suture of the vaginal angles. Over-vigorous displacement of the bladder may damage the muscle wall or its blood supply and give rise to a vesico-vaginal fistula at a later date. (c) During operation for cervical and broad ligament fibroids, in operations for pyosalpinx, and in Millin's extraperitoneal fascial strap operation for stress incontinence of urine. The bladder and ureters should be dealt with under direct vision in a Wertheim liysterectomy.

In the author's series of 270 abdominal hysterectomies the bladder was injured in 4 cases. He has also treated 5 cases operated on by other surgeons. These 9 cases are reviewed in detail. The bladder may be injured in vaginal operations, if care is

not exercised in dividing the vesico-cervical ligament and the pillars of the bladder. Postoperative necrosis and fistula formation may result from over-vigorous digital pressure or blunt dissection during upward displacement of the bladder. The repair of a vesico-vaginal fistula after abdominal or vaginal hysterectomy may prove difficult. As such fistulae have a tendency to spontaneous cure, no attempt should be made to repair them until a minimum period of 3 months has elapsed. Urinary infection must be overcome by intensive treatment with ammonium chloride and sulphonamides. The operation should be deliberate and methodical, after the situation of the fistula has been clearly defined. As it is sometimes impossible, on account of the inaccessibility of the fistula and the formation of scar tissue, to utilize an accurate flap-splitting technique, the fistula should be dealt with by elliptical excision, the adherent margin being freed and united in 2 layers with interrupted catgut, ooo plain catgut for the bladder and o chromic for the vaginal mucosa. A self-retaining catheter is left in the bladder after operation for a period of 12 to 21 days. A free flow of urine through the catheter is maintained continuously by day and night. The reaction of the urine is tested four times daily and twice during the night, and kept acid by large doses of ammonium chloride. Sulphonilamide was found to be the most efficacious sulphonamide. T. N. MacGregor

2026. Surgical Treatment of Rectal Complications of Radiotherapy of Carcinoma of the Cervix. (Traitement cincarginal des complications rectales de la radiothérapie pour cancer de sal mérin. Possibilités de la chirurgie sympathique.)

By M. DARGENT and L. EICHOLZ. Lyon chir.

43, 199-218, Mar.-Apr. 1948. 8 figs.

In spite of careful assessment of dosage and distribution in radiotherapy of cancer of the cervix uteri this treatment is sometimes followed by local complications, particularly in the rectum. There is often a simple rectal irritation, with diarrhoea, which occurs from the eighth to the fifteenth day after the radiotherapy and soon subsides under treatment by opiates and wash-outs. Of 408 cases treated in the last 5 years the authors found 25 patients with more serious lesions; 6 had a definite proctitis and 12 a reaction which caused a slight stricture, while 5 developed a more severe stricture; and there were 2 recto-vaginal fistulae. Several

patients had associated lesions in the sigmoid or small intestine, and in some cases there was development of malignancy in the rectum or pelvic lymph nodes. The rectal lesions were sometimes due to faulty technique but, as in the case of a crateriform ulcer, occasionally were almost unavoidable.

Surgical treatment is directed towards relief of pain and correction of the obstruction due to the rectal narrowing. Left inguinal colostomy gives relief but is unpleasant. It was found that by lumbar sympathectomy both symptoms were relieved and colostomy was usually avoided. In cases of pronounced obstruction temporary colostomy enabled the strictured part of the rectum to be excised, after which the opening in the sigmoid was closed. Sometimes relief was obtained merely by injecting the lumbar sympathetic with a local analgesic; this method was suitable for the early and ulcerative form of reaction affecting the anterior wall of the rectum.

Zachary Cope

Miscellaneous.

2027. A Rare Case of Idiopathic Inversion of the Uterus. (Idiopathias méhkifordulas ritka esete.)

By S. Arvary. Orv. Lapja, 4, 562-564, Apr. 25, 1948. 1 fig.

2028. Mucous Membrane Changes of the Vulva in Pernicious Anaemia. (Möllersche Schleimhautveranderungen an der Vulva.)

By A. KATHE. Derm. Wschr., Leipzig, 119, 148-

156, 1947. 3 figs., 7 refs.

The changes of the vulva which the author describes are similar in character to glossitis in pernicious anaemia. The lesions consisted of bright red patches of erythema, often symmetrically arranged. In several patients they gave rise to a burning sensation. Like the glossitis, the condition was often found to precede frank pernicious anaemia by many years. More rarely the same condition accompanied hypochromic anaemia. These vulval changes responded to liver and iron therapy respectively. The differential diagnosis is discussed and particular mention is made of trichomonas vaginitis, tertiary syphilis, and lichen planus. Three fully developed and 5 suspected early cases of pernicious anaemia with these vulval changes are presented. As these changes are often precursors of pernicions anaemia, their discovery should lead to early diagnosis and specific treatment. G. W. Csouka